Exercise 1

Repeated multiplication

From the school book

Remember · Understand · Apply · Problem Solving

Interactive test

1 **Calculate each of the following , then put the result in the simplest form :**

1 📖 $(\frac{1}{3})^4$ | 2 $(\frac{3}{5})^2$ | 3 📖 $(-\frac{1}{7})^3$

4 📖 $(-\frac{3}{4})^4$ | 5 $(\frac{5}{9})^0$ | 6 $(-2\frac{1}{2})^3$

7 $(0.04)^2$ | 8 $(1.5)^3$ | 9 $(-3.2)^2$

2 **Calculate each of the following , then put the result in the simplest form :**

1 $8 \times (\frac{1}{2})^3$ | 2 📖 $(-\frac{3}{4})^2 \times \frac{8}{27}$ | 3 📖 $(-\frac{3}{5})^3 \times (-\frac{25}{27})$

4 $(\frac{3}{5})^2 \div (-\frac{9}{125})$ | 5 $(\frac{4}{3})^2 \times (\frac{3}{2})^3$ | 6 📖 $(-\frac{5}{6})^2 \div 3\frac{3}{4}$

7 $(2\frac{1}{2})^2 \times \frac{4}{25}$ | 8 📖 $2\frac{7}{9} \div (-1\frac{2}{3})^2$

3 **Calculate each of the following , then put the result in the simplest form :**

1 $(\frac{4}{5})^2 \times \frac{5}{16} \times (\frac{2}{3})^0$ | 2 $\frac{3}{4} \times (-\frac{2}{3})^3 \times (\frac{3}{2})^2$

3 $(-\frac{5}{3})^4 \times (-\frac{3}{5})^3 \times (-1)^7$ | 4 📖 $(-\frac{2}{3})^3 \times (\frac{1}{3})^3 \div (-\frac{2}{9})^2$

5 📖 $[(\frac{5}{2})^3 \div (\frac{3}{2})^4] \times (\frac{3}{5})^3$ | 6 📖 $(-\frac{1}{2})^3 \div [8 \times (-\frac{1}{2}) \times \frac{3}{4}]$

4 Choose the correct answer from those given :

1 The multiplicative inverse of the number $\left(\frac{2}{5}\right)^0$ is .....

(a) $\frac{5}{2}$ (b) $-\frac{2}{5}$ (c) 1 (d) 0

2 The additive inverse of the number $(-3)^0$ is .....

(a) 1 (b) -3 (c) 3 (d) $-(3)^0$

3 The multiplicative inverse of the number $(-1)^3$ is .....

(a) $(-1)^3$ (b) $(-1)^2$ (c) 1^3 (d) 1^2

4 The additive inverse of the number $\left(-\frac{2}{5}\right)^2$ is .....

(a) $\frac{4}{25}$ (b) $-\frac{4}{25}$ (c) $\frac{25}{4}$ (d) $-\frac{25}{4}$

5 $\left(\frac{1}{4}\right)^0 + \frac{1}{4} =$ .....

(a) $\frac{1}{4}$ (b) $\frac{3}{4}$ (c) $\frac{5}{4}$ (d) $\frac{2}{4}$

6 $\left(\frac{5}{3}\right)^2 \times \left(\frac{3}{5}\right)^0 =$ .....

(a) $\frac{5}{3}$ (b) $\frac{25}{9}$ (c) 0 (d) 1

7 If $x = y$, then $\left(\frac{3}{5}\right)^{x-y} =$ .....

(a) $\frac{3}{5}$ (b) $\frac{5}{3}$ (c) 1 (d) 0

8 $\left(\frac{a}{b}\right)^2 \times \frac{b^2}{a^2} =$ ..... (where $ab \neq 0$)

(a) ab (b) $\left(\frac{a}{b}\right)^4$ (c) $(ab)^0$ (d) $\frac{a}{b}$

9 If $x = -\frac{1}{2}$ and $y = 3$, then $x^y =$ .....

(a) $\frac{1}{8}$ (b) $-\frac{1}{8}$ (c) $\frac{1}{6}$ (d) $-\frac{1}{6}$

10 If $y^{26} + y^{27} = 0$, then $y =$ .....

(a) 1 (b) -1 (c) 2 (d) -2

5 Complete the following :

1 $\frac{8}{27} = \left(\frac{2}{3}\right)^{.....}$

2 $\frac{9}{16} = \left(\frac{3}{4}\right)^{.....}$

3 $-\frac{64}{125} = \left(-\frac{4}{5}\right)^{.....}$

4 $2\frac{1}{4} = \left(\frac{3}{2}\right)^{.....}$

5 $0.027 = \left(\frac{3}{10}\right)^{.....}$

6 $64\ \% = \left(\frac{4}{5}\right)^{.....}$

7 If $\frac{x}{y} = -\frac{2}{5}$, then $\left(\frac{x}{y}\right)^3 =$ .....

8 If $x = \frac{1}{2}$ and $y = \frac{2}{3}$, then $x^2 y^2 =$ .....

9 📖 $(-\frac{1}{2})^3 - (-\frac{1}{2})^2 =$ .....

10 $2^2 + 2^2 = 2^{.....}$

11 $\frac{3}{4}$, $\frac{9}{16}$, $\frac{27}{64}$, ... , ... (in the same pattern)

12 The greater number of the two numbers $(\frac{1}{4})^2$ and $(-\frac{8}{3})^5$ is .....

6 If $x = -\frac{2}{3}$ and $y = -\frac{1}{3}$, find the value of : $x^2 + y^3$ « $\frac{11}{27}$ »

7 If $a = \frac{2}{3}$ and $b = -\frac{4}{3}$, find the value of : $|a^3 \div b^3|$ « $\frac{1}{8}$ »

8 If $x = 0.5$, $y = -\frac{2}{3}$ and $z = -3$, find the value of : $9\,x\,y^2 - z^3$ « 29 »

9 📖 If $a = -\frac{1}{2}$, $b = 2$ and $c = \frac{3}{4}$, find the numerical value of : $a^3 b^2 + b^2 c - 8\,abc$ « $8\frac{1}{2}$ »

10 📖 **If $x = -\frac{3}{2}$, $y = \frac{1}{2}$ and $z = -\frac{4}{3}$, find the numerical value of each of the following in its simplest form :**

1 $x^2 y^2 z^2$ « 1 »

2 $x^2 \div z^2$ « $\frac{81}{64}$ »

3 $x^2 - y\,z^2$ « $\frac{49}{36}$ »

4 $\frac{x^2 y^2 z^2}{x + y}$ « -1 »

Geometric Application

11 If $V = \ell^3$ where V is the volume of a cube and ℓ is its edge length , then calculate the volume of the cube whose edge length is $1\frac{1}{2}$ cm. « $\frac{27}{8}$ cm^3 »

For excellent pupils

12 Choose the correct answer from those given :

1 If $y = (\frac{1}{2})^x$ where $x \in \{0 , 1 , 2 , 3\}$, then y takes its maximum value when $x =$ .....

(a) 0 (b) 1 (c) 2 (d) 3

2 If $y = (-\frac{2}{5})^x$ where $x \in \{0 , 1 , 3 , 4\}$, then y takes its minimum value when $x =$ .....

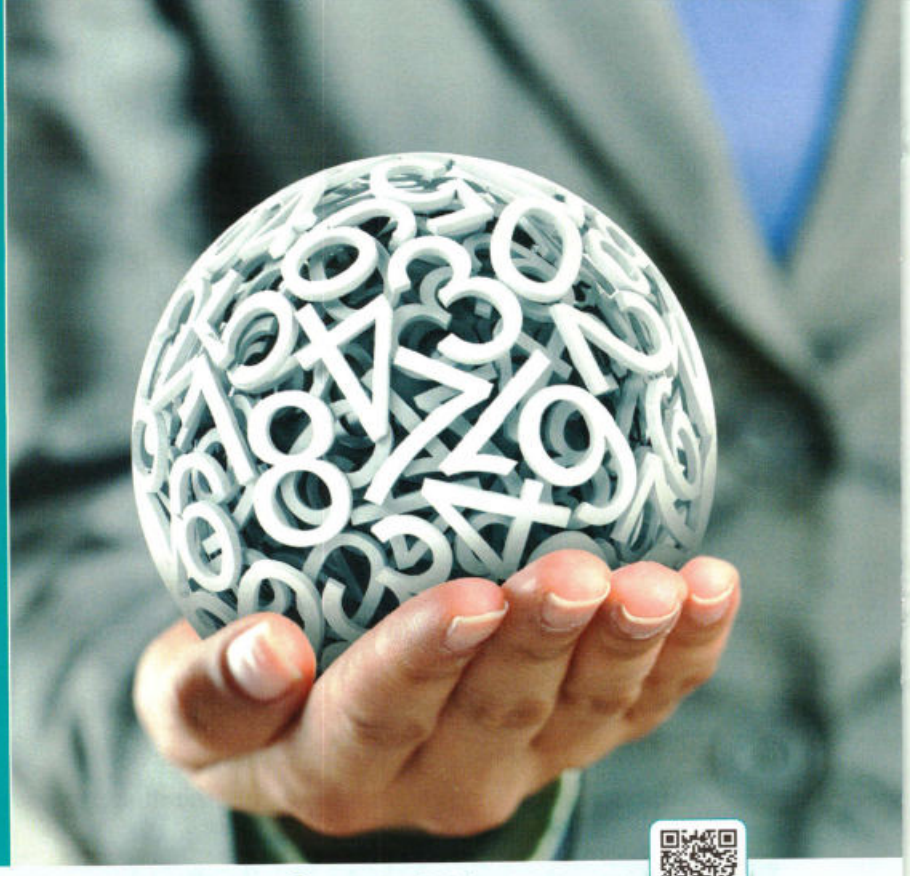
(a) 0 (b) 1 (c) 3 (d) 4

13 Arrange the following numbers ascendingly without expanding :

$(\frac{2}{3})^2 , (-\frac{2}{3})^3 , (-\frac{1}{3})^2 , (-\frac{1}{3})^3$

Exercise **2**

Non-negative integer powers



From the school book

Remember · Understand · Apply · Problem Solving

Interactive test

1 Calculate each of the following , then put the result in the simplest form :

1 $(\frac{2}{3})^3 \times (\frac{2}{3})^2$

2 $(-\frac{2}{3})^3 \times (\frac{2}{3})^2$

3 $\frac{1}{5} \times (-\frac{1}{5})^4$

4 $(\frac{1}{6})^9 \div (\frac{1}{6})^8$

5 $(\frac{2}{7})^5 \div (\frac{2}{7})^3$

6 $(-\frac{3}{5})^7 \div (\frac{3}{5})^5$

7 $(-\frac{5}{2})^2 \div 2\frac{1}{2}$

8 $(\frac{1}{2})^2 \times \frac{1}{2} \times (\frac{1}{2})^3$

9 $(\frac{4}{5})^8 \div (\frac{4}{5})^6 \times \frac{4}{5}$

2 Calculate each of the following , then put the result in the simplest form :

1 $\frac{3^7 \times 3^3}{3^6}$

2 $\frac{2^6 \times 2}{2^3 \times 2^4}$

3 $\frac{(-5)^4 \times 5^2}{5^3}$

4 $\frac{(-2)^5 \times 2^4}{(-2)^3 \times 2^2}$

5 $\frac{(-3)^5 \times (-2)^7}{(-3)^3 \times (-2)^5}$

6 $\frac{x^4 \times y^3 \times x^5}{x^6 \times y^2}$

3 Find each of the following in the simplest form :

1 $\left(\frac{a\,b}{c}\right)^5$

2 $\left(\frac{5x}{3y}\right)^2$

3 $\left(-\frac{2\,a\,b}{3\,c}\right)^4$

4 $\left(\frac{x^2}{y^3}\right)^2$

5 $\left(\frac{a^3 b^2}{c^5}\right)^3$

6 $\left(-\frac{c^2}{d}\right)^3$

7 $\left(-\frac{x^3}{y^2}\right)^2$

8 $\frac{(4x^3 y^2)^7}{(2x^2 y)^7}$

9 $\frac{(2a)^3 \times (2a)^4}{(-2a)^6 \times a}$

4 **Calculate each of the following , then put the result in the simplest form :**

1 $[(\frac{1}{2})^2]^2$

2 $[(-\frac{3}{2})^2]^5$

3 $[(2\frac{1}{2})^3]^2$

4 $(\frac{3}{5})^{10} \times (\frac{5}{3})^{10}$

5 $\left((\frac{2}{7})^2\right)^3 \times (\frac{7}{2})^6$

6 $(2\frac{1}{2})^2 \times (-\frac{2}{5})^2$

5 **Choose the correct answer from those given :**

1 $3^2 \times 3^5 =$ .....

(a) 3^7 (b) 3^3 (c) 3^{10} (d) 3^{25}

2 $5^2 + 5^2 =$ .....

(a) 10^2 (b) 10^4 (c) 5^4 (d) 50

3 $3^5 \times 2^5 =$ .....

(a) 5^{10} (b) 6^{10} (c) 6^5 (d) 6^{25}

4 $(5a)^0 =$ ..... , $a \neq 0$

(a) 5 (b) a (c) 5 a (d) 1

5 $3^{(2^3)} =$ .....

(a) 3^6 (b) 3^5 (c) 3^8 (d) 3^{23}

6 $(5^2)^3 =$ .....

(a) 5^6 (b) 5^5 (c) 5^{23} (d) 5

7 $3^{10} + 3^{10} + 3^{10} =$ .....

(a) 3^{10} (b) 3^{30} (c) 9^{10} (d) 3^{11}

8 $4^x + 4^x + 4^x + 4^x =$ .....

(a) 4^{x+4} (b) 4^{4x} (c) 4^{x+1} (d) $4x^4$

9 $\frac{(3^2)^5}{(3^5)^2} =$ .....

(a) 3^{10} (b) 3^{52} (c) 3^{25} (d) 1

10 $\frac{(x^2)^3}{x^3} =$ ..... , $x \neq 0$

(a) x^6 (b) x^2 (c) x^3 (d) x

11 $(2\,y)^3 =$ .....

(a) $2\,y^3$ (b) $8\,y$ (c) $8\,y^3$ (d) $23\,y$

12 $(b^3)^4 =$ .....

(a) b^{34} (b) b^7 (c) $b^3 \times b^3 \times b^3$ (d) $b^4 \times b^4 \times b^4$

13 The quarter of the number 4^{20} = ...

(a) 4^5 (b) 4^{10} (c) 4^{19} (d) 2^{10}

6 Simplify to the simplest form :

$\frac{(2\,y)^4 \times (3\,y)^2}{12\,y^5}$, then find the value of the result at $y = -\frac{1}{6}$ « – 2 »

7 If $a = \frac{5}{3}$, $b = -\frac{3}{2}$ and $c = \frac{2}{5}$, **find the numerical value of each of :**

1 $\frac{(a^2\,c^2)^2}{b}$ 2 $\left(\frac{2\,a\,b}{5\,c}\right)^3$ « $-\frac{32}{243}$, $-\frac{125}{8}$ »

8 If $x = -\frac{1}{2}$, $y = \frac{3}{4}$ and $z = -\frac{3}{2}$,

find the numerical value of each of the following in the simplest form :

1 $x^3\,y^2$ 2 $y^3\,x^2$ 3 $\frac{x^3}{y^2\,z^2}$

« $-\frac{9}{128}$, $\frac{27}{256}$, $-\frac{8}{81}$ »

9 Complete the following :

1 $\left(\left(\frac{7}{9}\right)^{3}\right)^4 = \frac{7^{12}}{3^{.....}}$

2 If $\left(\frac{3}{4}\right)^5 \times x = \left(\frac{3}{4}\right)^7$, then $x =$ .....

3 The greater number of the two numbers $\left((-3)^5\right)^3$ and $\left((-3)^2\right)^4$ is .....

4 $\left((-1)^5\right)^2 - \left((-1)^3\right)^2 =$ .....

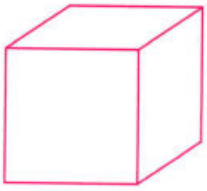
5 $\frac{4^4}{4^3} + \frac{4^3}{4^2} + \frac{4^2}{4} + 4 = 2$ .....

6 $2^{2x} \times 4^x = 4$.....

Geometric Applications

10 Find the area of the square whose side length is $\frac{2x}{5}$ cm.

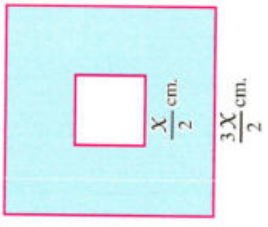
11 Find the volume of the cube whose edge length is $\frac{3a^3}{7}$ cm.



12 **In the opposite figure :**

A square is drawn inside another square.

Find the area of the shaded part.



For excellent pupils

13 If four times a number is 4^3 , find $\frac{3}{4}$ this number.

« 12 »

14 If $x = \frac{1}{5}$ and $y = 5$, find the value of : $x^{15}\, y^{14}$

«$\frac{1}{5}$»

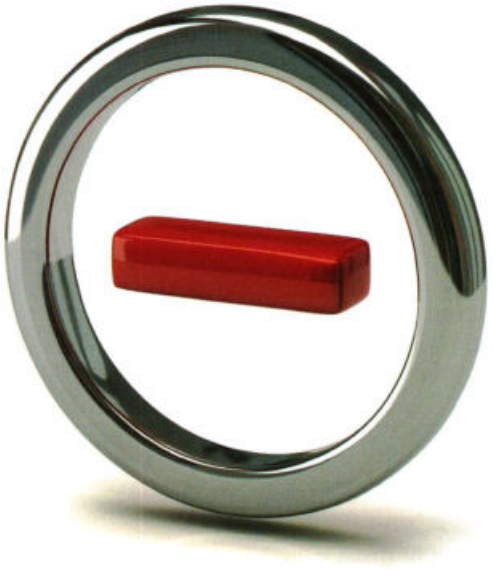
15 **Prove that :**

1 $5^{x+2} - 5^{x+1} = 20 \times 5^x$

2 $3^{15} + 3^{14}$ is divisible by 4

Exercise 3

Negative integer powers



From the school book

Remember · Understand · Apply · Problem Solving

Interactive test

1 Evaluate each of the following :

1 4^{-1} | 2 5^{-2} | 3 $\left(\frac{1}{2}\right)^{-1}$

4 $\left(-\frac{2}{3}\right)^{-2}$ | 5 $(0.2)^{-2}$ | 6 $(1.2)^{-1}$

2 Evaluate each of the following :

1 $3^7 \times 3^{-3}$ | 2 $2^{-2} \times 2^{-3}$ | 3 $\frac{3}{3^{-2}}$ | 4 $\frac{6^{-2}}{6^{-3}}$

3 Evaluate each of the following :

1 $(5^{-1})^{-3}$ | 2 $(3^{-2})^2$ | 3 $(0.25)^{-2}$

4 $(2^{-1} \times 2^{-2})^3$ | 5 $\left(\frac{3^{-1}}{3}\right)^2$ | 6 $\left(\frac{8^4}{8^{-4}}\right)^0$

4 Evaluate each of the following :

1 $\frac{8 \times 8^{-2}}{8^{-3}}$ | 2 $\frac{7^{-2} \times 7^5}{7^3}$ | 3 $\frac{2^5 \times 2^{-2}}{2^{-4} \times 2^3}$

4 $\frac{2^3 \times 2^{-3}}{(2^2)^2}$ | 5 $\frac{(3^{-2})^3}{3^{-2} \times 3^{-6}}$ | 6 $\left(\frac{9^3 \times 9}{9^5}\right)^{-3}$

7 $\left(\frac{2^5 \times 3^2}{3^4 \times 2^3}\right)^{-1}$ | 8 $(3^0 \times 2^{-2})^{-2}$ | 9 $\frac{(10)^2 \times (0.01)^3}{(10)^{-3}}$

5 Simplify each of the following and write the result in terms of positive exponents , where the denominator does not equal zero :

1 $7x^{-1}$

2 $x^{-1}y^{2}$

3 $a^{-2}b^{-3}$

4 $x^{3} \times x^{-5}$

5 $x^{3} \times x^{-2} \times x^{-1}$

6 $\frac{c^{-5}}{c^{2}}$

7 $(a^{-2})^{3}$

8 $(b^{-1})^{-3}$

9 $(a^{2} \times a^{-5})^{2}$

10 $(x^{2})^{-3} \times (x^{-3})^{-2}$

11 $\left(\frac{y^{5}}{y^{-2}}\right)^{-3}$

12 $\frac{x^{2} \times x^{-3}}{x^{-4} \times x}$

13 $\frac{(x^{2})^{-3} \times (x^{-1})^{2}}{x^{-3} \times x^{-4}}$

14 $\frac{a^{-1}}{b^{2}}\left(\frac{a^{-1}}{2b^{2}}\right)^{-2}$

15 $(x + x^{-1})^{2}$

6 Complete the following :

1 $2^{-3} \times c^{0} =$ .....

2 $(b^{-1})^{-3} = b^{.....}$

3 $2x^{-3} = \frac{2}{.....}$

4 $(3x^{-1})^{2} = 9x^{.....} = \frac{9}{.....}$

5 $(3y^{-2})^{-2} =$ .....

6 $(3a^{2})^{-1} = \frac{1}{.....}$

7 $2x^{-2}y^{-3} = \frac{2}{.....}$

8 $\frac{x^{-5}}{y^{-5}} = (.....)^{5}$

9 $(\frac{1}{2})^{2} + 2^{0} - (2)^{-2} =$ .....

10 $(x^{2})^{.....} = \frac{1}{x^{4}}$

11 $2^{10} \times 2^{-10} = 3^{.....}$

12 $a^{-5} + 1 = a^{-5}$ (..... + ...) , where $a \neq 0$

13 If $x = \frac{1}{2}$, $y = \frac{1}{4}$, then $(x - y)^{-1} =$ .....

7 Choose the correct answer from those given :

1 If $a^{-1} = \frac{2}{3}$, then a = ...

(a) $-\frac{2}{3}$ (b) $\frac{3}{2}$ (c) $-\frac{3}{2}$ (d) 1

2 If $a = 7^{x}$ and $b = 7^{-x}$, then $a \times b =$ .....

(a) 7^{2x} (b) 49^{2x} (c) 1 (d) 0

3 $\frac{5^{x}}{5^{-y}} =$ .....

(a) $5^{x \div y}$ (b) 5^{x-y} (c) 5^{x+y} (d) $-\frac{x}{y}$

4 $\frac{6a^{2}x^{4}}{2a^{3}x^{3}} =$ .....

(a) $3ax$ (b) $3a^{5}x^{7}$ (c) $\frac{3x}{a}$ (d) $\frac{3}{ax}$

5 $\frac{(-2s^{2}t)^{3}}{(-4st^{2})^{2}} =$ .....

(a) $-\frac{s^{3}}{2t}$ (b) $-\frac{s^{4}}{2t}$ (c) $\frac{s^{5}}{2t^{2}}$ (d) $\frac{s^{4}}{t}$

6 📖 $\left(\frac{m^2}{n^{-3}}\right)^{-1}\left(\frac{3\,m^{-2}}{n^{-2}}\right)^{-2} =$ .....

(a) $\frac{9\,m^2}{n^7}$ (b) $\frac{m^2}{9\,n^7}$ (c) $\frac{m^2}{9\,n}$ (d) $\frac{9\,m^6}{n}$

7 📖 $\frac{(2\,a\,b^{-2})^0}{3^0\,a^{-2}\,b} =$ .....

(a) $\frac{a^3}{3\,b^3}$ (b) a^2 (c) 1 (d) $\frac{a^2}{b}$

8 If $a^x = 2$ and $a^{-y} = 3$, then $a^{x-y} =$ .....

(a) 1 (b) – 1 (c) $\frac{2}{3}$ (d) 6

9 If $x\,y^{-1} = \frac{1}{2}$, then $\frac{y}{x} =$ .....

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) 1 (d) 2

10 $3^{-1} + 3^{-1} + 3^{-1} =$ .....

(a) 3^{-3} (b) 3^3 (c) 9^{-3} (d) 1

11 The multiplicative inverse of 5^{-1} is .....

(a) $\frac{1}{5}$ (b) 5 (c) – 5 (d) $-\frac{1}{5}$

12 $(\frac{3}{5})^2 \times (\frac{5}{3})^{-2} =$ .....

(a) $(\frac{3}{5})^4$ (b) 1 (c) $(\frac{3}{5})^{-4}$ (d) 0

8 Complete each of the following by the suitable sign of (>) , (<) or (=) :

1 2^{10} ..... 2^{-10} | 2 3^{-20} ..... 3^2 | 3 5^{-15} ..... 2^{-15}

4 $(-7)^{-2}$ ..... $(-7)^{19}$ | 5 $(-1)^{-6}$ ..... $(-1)^{-9}$ | 6 $(-1)^{-20}$ ..... $(1)^{-10}$

9 📖 Why b^{-3} is not defined when $b = 0$?

10 Calculate the value of $(-\frac{3}{5})^x \times (\frac{3}{5})^y$ in each of the following cases :

1 $x = -2$ and $y = 2$ « 1 » 2 $x = -1$ and $y = 2$ « $-\frac{3}{5}$ »

11 If $x = -\frac{1}{3}$, $y = \frac{2}{3}$, then find in the simplest form the numerical value of the expression : $(\frac{y}{x^2})^{-2}$ « $\frac{1}{36}$ »

12 **Simplify to the simplest form :** $\frac{2^{10} \times 3^4}{(12)^5}$ « $\frac{1}{3}$ »

13 **Simplify to the simplest form :**

$\frac{6^{2n+1} \times 4^{-n}}{2^n \times 3^{2n+1}}$, then find the value of the result when n = 3 « $\frac{1}{4}$ »

Life Applications

14 The flea can jump at a height of 200 times of its length.
If a flea of length 2^{-4} inches can jump at a height of 2^3 inches
What does this height represent according to the length of the flea ?

15 The population of a city has been growing exponentially. It is estimated that in (t) years the population (p) will be : $p = 2\,(1.03)^t$ million.

1 What will the population be in 2 years ?
2 What is the population now ?
3 What was the population last year ?

For excellent pupils

16 **If $2^n = 3$, find the value of :**

1 2^{n+1} 2 4^n 3 4^{-n} 4 2^{n-1} « 6 , 9 , $\frac{1}{9}$, $\frac{3}{2}$ »

17 **If a = 5 and $b = 5^{-1}$, find the value of :** $a^{51}\, b^{50}$ « 5 »

18 **Without expanding , arrange the following ascendingly by inspection :**
$(-2)^{-15}$, $(-5)^{20}$, $(-2)^{15}$, 2^{-20} , $(-5)^{15}$, $(-2)^{20}$

Test 1

Total mark: 10

Answer the following questions :

1 Choose the correct answer from the given ones : (3 Marks)

1 The multiplicative inverse of $\left(\frac{-3}{5}\right)^2$ is .....

(a) $-\left(\frac{5}{3}\right)^2$ (b) $\frac{-9}{25}$ (c) $\frac{25}{9}$ (d) $\left(\frac{3}{5}\right)^2$

2 $\frac{x^{-5}}{y^{-5}} = (.....)^5$, $y \neq 0$, $x \neq 0$

(a) xy (b) $\frac{y}{x}$ (c) $x - y$ (d) $\frac{x}{y}$

3 If $2^{10} + 2^{10} = 2^k$, then k = ...

(a) 4 (b) 20 (c) 100 (d) 11

---

2 Complete : (3 Marks)

1 $6^2 + 6 \times 6 \div 6 - 6 =$ .....

2 $\frac{-27}{125} = \left(\frac{-3}{5}\right)^{.....}$

3 If the standrad form of -0.0002 is -2×10^n , then n = ...

---

3 If $x = 0.4$, $y = \frac{1}{2}$, $z = -2$ (2 Marks)

Find the value of : $2xy + z^2$

---

4 Simplify : $\frac{b^3 \times b^{-5}}{b^{-2} \times b^6}$ (where $b \neq 0$) (2 Marks)

, then find the value of the result when b = 2

Test 2

Total mark: 10

Answer the following questions :

1 Choose the correct answer from the given ones : **(3 Marks)**

1 If $2^{-5} \times 3^{-5} = 6^{k}$, then k = ...

(a) 6 (b) – 10 (c) 25 (d) – 5

2 If $0.0028 = 2.8 \times a$, then a = ...

(a) 3 (b) – 3 (c) 10^{3} (d) 10^{-3}

3 $4\,x^{-1}\,y^{-2} = \frac{4}{\text{.....}}$ (where $x \neq 0$, $y \neq 0$)

(a) $y^{2}\,x^{-1}$ (b) $x\,y^{-2}$ (c) $x\,y^{2}$ (d) $y\,x^{2}$

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2 Complete : **(3 Marks)**

1 The additive inverse of $(-1)^{3}$ is .....

2 $[4 - (5 - 2)] - 1$ = ...

3 If $\left(\frac{x-3}{5}\right)^{0} = 1$, then $x \neq$ .....

---

3 Find the following in the standard form : **(2 Marks)**

$(18 \times 10^{9}) \div (3 \times 10^{4})$

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4 Simplify to the simplest form : $\frac{4^{n+1} \times 3^{n-1}}{12^{n}}$ **(2 Marks)**

Exercise **1**

Deductive proof

From the school book

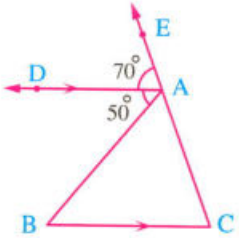
● Remember ● Understand ○ Apply Problem Solving

Interactive test

1 **In the opposite figure :**

$\overrightarrow{AD} // \overline{BC}$, m (∠ DAB) = 50° and m (∠ DAE) = 70°

Find the measures of the angles of Δ ABC



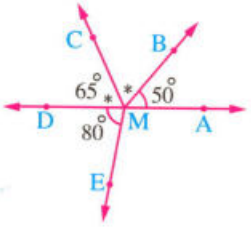
Complete the following table by writting the reason of each step of the solution steps :

Mathematical Statement	The reason
m (∠ DAB) = 50° , m (∠ DAE) = 70°	1 .....
m (∠ CAB) = 180° – (50° + 70°) = 60°	2 .....
$\overrightarrow{AD} // \overline{BC}$	3 .....
m (∠ C) = m (∠ DAE) = 70°	4 .....
m (∠ B) = m (∠ DAB) = 50°	5 .....

2 **In the opposite figure :**

m (∠ AMB) = 50° , m (∠ EMD) = 80° , $\overrightarrow{MC}$ bisects ∠ BMD and m (∠ CMD) = 65°

Complete the following proof to find m (∠ AME)



Given .....

R.T.F. .....

Proof

∵ $\overrightarrow{MC}$ bisects ∠ ..... (given)

∴ m (∠ BMC) = m (∠ .....) = ...°

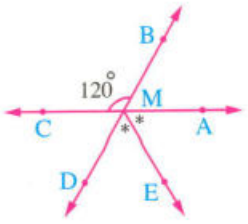
∵ m (∠ AMB) + m (∠ BMC) + m (∠ CMD) + m (∠ DME) + m (∠ AME) = ...°

∴ m (∠ AME) = ...° – .....° = ...° (The req.)

3 **In the opposite figure :**

$\overleftrightarrow{AC} \cap \overleftrightarrow{BD} = \{M\}$, m (∠ BMC) = 120°

and $\overrightarrow{ME}$ bisects ∠ AMD



Complete the following proof to find m (∠ EMC)

Given .....

R.T.F. .....

Proof

∵ $\overleftrightarrow{AC} \cap \overleftrightarrow{BD} = \{M\}$

∴ m (∠ BMC) = m (∠ .....) (V.O.A.)

∴ m (∠ .....) = 120°

∵ $\overrightarrow{ME}$ bisects ∠ AMD

∴ m (∠ .....) = m (∠ .....)

∴ m (∠ EMD) = $\frac{\text{.....}}{\text{.....}}$ = ...°

∵ M ∈ $\overleftrightarrow{BD}$

∴ m (∠ BMC) + m (∠ .....) = 180°

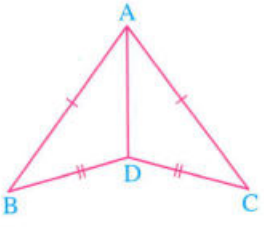
∴ m (∠ DMC) = ...° − .....° = ...°

∵ m (∠ EMC) = m (∠ .....) + m (∠ .....)

∴ m (∠ EMC) = ...° + ...° = ...° (The req.)

4 **In the opposite figure :**

AB = AC , BD = CD



Complete the following proof to prove that $\overrightarrow{AD}$ bisects ∠ BAC

Given .....

R.T.P. .....

Proof

∵ In Δ ADB , ... :

AB = ... (given)

..... = CD (given)

$\overline{AD}$ .....

∴ Δ ADB ≡ Δ ..... , then we deduce that :

m (∠ .....) = m (∠ .....)

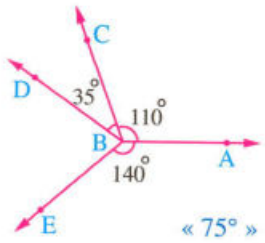
∴ $\overrightarrow{AD}$ bisects ∠ ..... (Q.E.D.)

5 🕮 **In the opposite figure :**

m (∠ ABC) = 110° , m (∠ CBD) = 35°

and m (∠ ABE) = 140°

Find : m (∠ EBD)



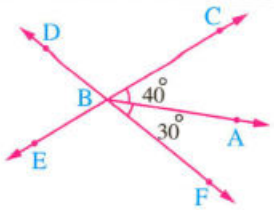
« 75° »

6 **In the opposite figure :**

$\overleftrightarrow{CE} \cap \overleftrightarrow{FD} = \{B\}$,

m (∠ ABC) = 40° and m (∠ ABF) = 30°

Find : m (∠ DBE)



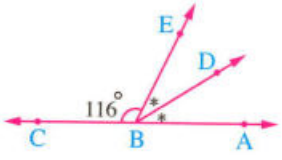
« 70° »

7 🕮 **In the opposite figure :**

$B \in \overleftrightarrow{AC}$, m (∠ CBE) = 116°

and $\overrightarrow{BD}$ bisects ∠ ABE

Find : m (∠ ABD)



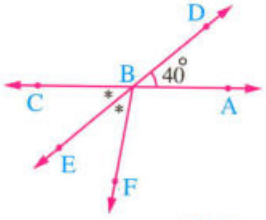
« 32° »

8 🕮 **In the opposite figure :**

$\overleftrightarrow{AC} \cap \overleftrightarrow{DE} = \{B\}$, m (∠ ABD) = 40°

and $\overrightarrow{BE}$ bisects ∠ CBF

Find : m (∠ ABF)



« 100° »

9 **In the opposite figure :**

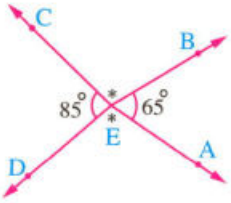
$\overrightarrow{EA} \cap \overrightarrow{EB} \cap \overrightarrow{EC} \cap \overrightarrow{ED} = \{E\}$

If m (∠ BEC) = m (∠ AED)

, m (∠ AEB) = 65° , m (∠ CED) = 85°

Find : m (∠ BEC)

Are A , E and C on the same straight line ? Why ?

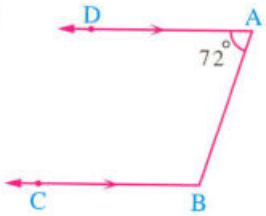


« 105° »

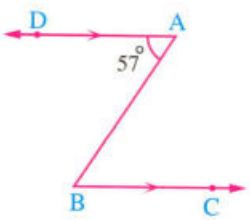
10 🕮 **In each of the following figures ,**

If $\overrightarrow{AD} // \overrightarrow{BC}$ **Find :** m (∠ ABC) , giving reason.

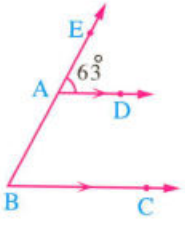
1



2



3



11 **In the opposite figure :**

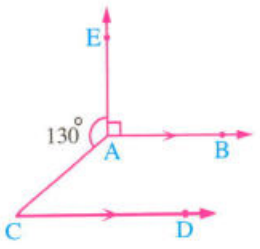
$\overrightarrow{AB} // \overrightarrow{CD}$

, m (∠ EAC) = 130°

and m (∠ EAB) = 90°

Find : 1 m (∠ BAC)

2 m (∠ C)



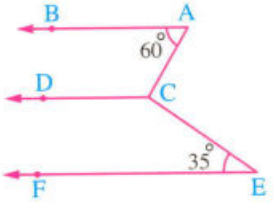
« 140° , 40° »

12 **In the opposite figure :**

$\overrightarrow{AB} // \overrightarrow{CD}$, $\overrightarrow{AB} // \overrightarrow{EF}$

, m (∠ A) = 60° and m (∠ E) = 35°

Find : m (∠ ACE)



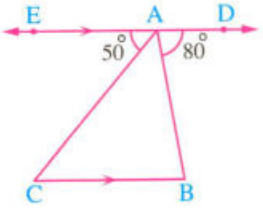
« 95° »

13 **In the opposite figure :**

$\overleftrightarrow{DE} // \overleftrightarrow{BC}$, A ∈ $\overline{DE}$, m (∠ DAB) = 80°

and m (∠ EAC) = 50°

Find the measures of the angles of Δ ABC



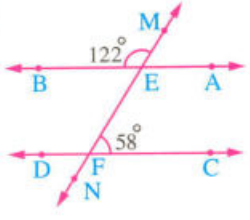
« m (∠ BAC) = 50° , m (∠ B) = 80° , m (∠ C) = 50° »

14 🕮 **In each of the following figures,**

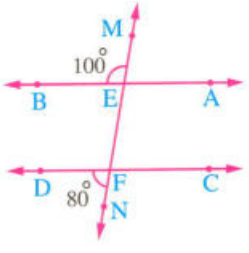
If $\overleftrightarrow{MN}$ intersects $\overleftrightarrow{AB}$, $\overleftrightarrow{CD}$ at E and F respectively,

Prove that : $\overleftrightarrow{AB} // \overleftrightarrow{CD}$

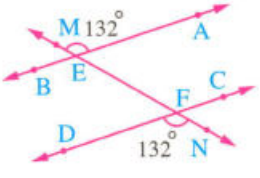
1



2



3

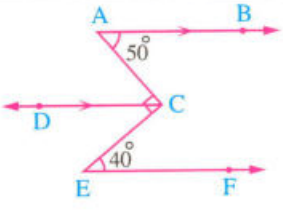


15 🕮 **In the opposite figure :**

$\overrightarrow{AB} // \overrightarrow{CD}$, m (∠ A) = 50° ,

∠ ACE is right and m (∠ E) = 40°

Prove that : $\overrightarrow{AB} // \overrightarrow{EF}$

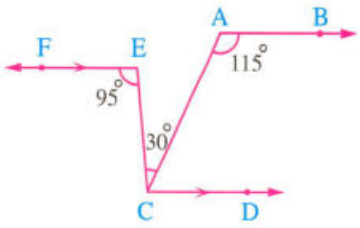


16 **In the opposite figure :**

$\overrightarrow{EF} // \overrightarrow{CD}$, m ($\angle$ CEF) = 95° ,

m ($\angle$ ACE) = 30° , m ($\angle$ BAC) = 115°

Prove that : $\overrightarrow{AB} // \overrightarrow{EF}$



17 **In the opposite figure :**

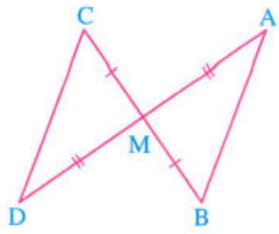
$\overline{AD} \cap \overline{BC} = \{M\}$,

MA = MD and MB = MC

Prove that :

1 AB = CD

2 $\overline{AB} // \overline{CD}$



18 **Prove that :**

1 A straight line which is perpendicular to one of two parallel lines in the same plane is also perpendicular to the other.

2 A straight line that is parallel to one of two parallel lines is also parallel to the other.

19 **In the opposite figure :**

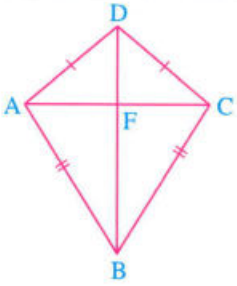
AD = CD and AB = BC

Use the properties of congruent triangles

to show that :

1 $\overrightarrow{DB}$ bisects $\angle$ ADC

2 $\overline{AC}$ and $\overline{DB}$ are perpendicular to each other.



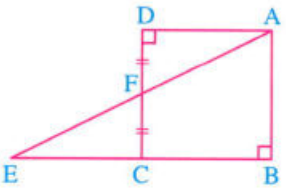
20 **In the opposite figure :**

ABCD is a square in which F

is the midpoint of $\overline{CD}$

and $\overrightarrow{AF} \cap \overrightarrow{BC} = \{E\}$

Prove that : CE = CB



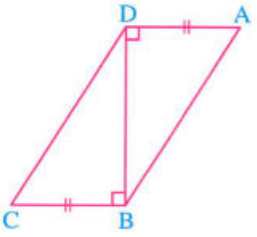
21 **In the opposite figure :**

AD = BC and m ($\angle$ ADB) = m ($\angle$ DBC) = 90°

Prove that :

1 AB = CD

2 $\overline{AB} // \overline{CD}$

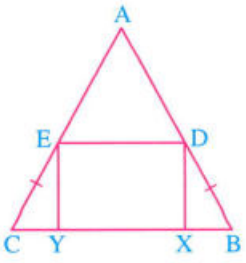


22 **In the opposite figure :**

EC = DB and

DXYE is a rectangle.

Prove that : m (∠ ADE) = m (∠ AED)



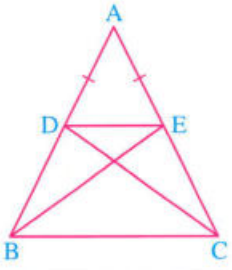
23 **In the opposite figure :**

AD = AE and

m (∠ ADC) = m (∠ AEB)

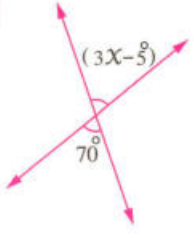
Show that :

1 BE = CD 2 BD = CE

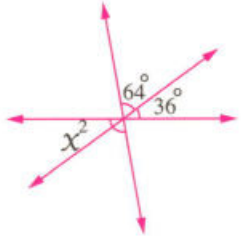


24 **Find the values of x and y in each of the following :**

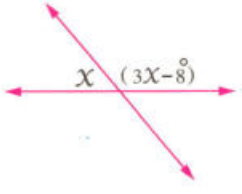
1



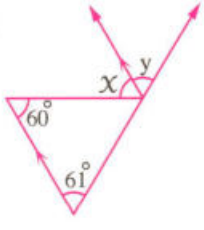
2



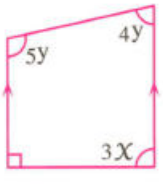
3



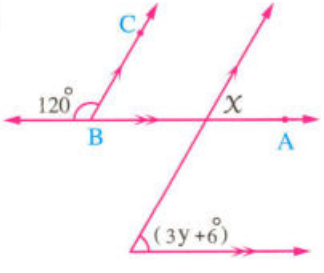
4



5



6



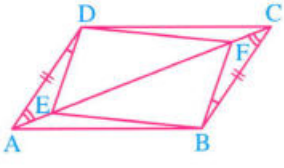
For excellent pupils

25 **In the opposite figure :**

1 Is Δ ADE congruent to Δ CBF ? Give your reason (s).

2 **Prove that :**

First : Δ DEF ≡ Δ BFE **Second :** Δ ABE ≡ Δ CDF

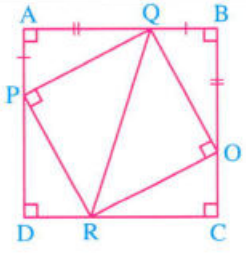


26 **In the opposite figure :**

1 Is Δ PAQ congruent to Δ QBO ? Give your reason (s).

2 **Show that :**

First : Δ PQR ≡ Δ OQR **Second :** Δ PDR ≡ Δ RCO



Exercise **2**

The polygon

From the school book

● Remember ● Understand ○ Apply Problem Solving

Interactive test

1 Complete the following :

1 The regular polygon is the one in which :

(a) ..... (b) .....

2 The sum of measures of the interior angles of the quadrilateral = ... °

3 The sum of measures of the interior angles of the pentagon = ... °

4 The sum of measures of the interior angles of the hexagon = ... °

5 The sum of measures of the interior angles of the heptagon = ... °

6 The measure of the interior angle of the regular pentagon = ... °

and the measure of the interior angle of the regular heptagon = ... °

7 The sum of measures of the exterior angles of the hexagon equals ..... °

8 If the perimeter of a regular hexagon is 30 cm. , then its side length = ... cm.

and the measure of each interior angle in it = ... °

9 If the perimeter of a regular polygon = 80 cm. and its side length = 10 cm. ,

then the measure of each interior angle in it = ... °

2 Choose the correct answer from those given :

1 The sum of measures of the interior angles of a polygon of n sides equals .....

(a) $n \times 180°$ (b) $(n - 2) \times 180°$ (c) $\frac{(n-2) \times 180°}{2}$ (d) $\frac{(n-2) \times 180°}{2n}$

2 The measure of the interior angle of a regular polygon of n sides equals .....

(a) $\frac{(n-2)\times 90^\circ}{n}$ (b) $\frac{(n-2)\times 180^\circ}{2}$ (c) $\frac{(n-2)\times 180^\circ}{n}$ (d) $180^\circ \times (n-1)$

3 The measure of the interior angle of the regular polygon of 10 sides equals .....

(a) 72° (b) 108° (c) 144° (d) 150°

4 The measure of the interior angle of a regular polygon of 18 sides equals .....

(a) 130° (b) 140° (c) 150° (d) 160°

5 If the measure of an interior angle of a regular polygon is 135° , then the number of its sides is .....

(a) 6 (b) 4 (c) 7 (d) 8

6 The sum of measures of the exterior angles of the triangle equals .....

(a) 90° (b) 180° (c) 360° (d) 720°

7 In the quadrilateral ABCD , if m (∠ A) = 2 m (∠ B) = m (∠ C) = 96° , then m (∠ D) = ...

(a) 96° (b) 48° (c) 120° (d) 144°

3 Find the number of the diagonals of each of the following figures :

1 Triangle.

2 Quadrilateral.

3 Pentagon.

Hint : The number of diagonals of the polygon of n sides = $\frac{n(n-3)}{2}$

4 In each of the following , find the measure of the angle marked by (?) :

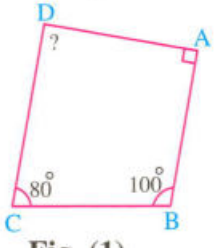


Fig. (1)

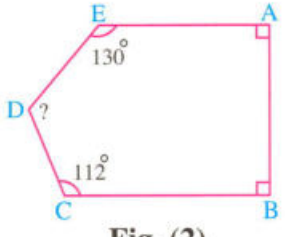


Fig. (2)

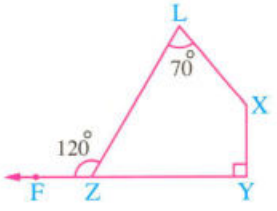
« 90° , 118° »

5 In the opposite figure :

F ∈ $\overrightarrow{YZ}$, m (∠ L) = 70° ,

m (∠ Y) = 90° and m (∠ LZF) = 120°

Find : m (∠ X)



« 140° »

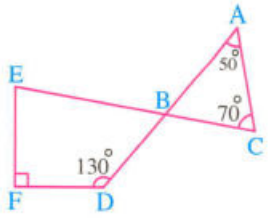
6 **In the opposite figure :**

$\overline{CE} \cap \overline{AD} = \{B\}$, m (∠ A) = 50°

, m (∠ C) = 70° , m (∠ D) = 130° and

m (∠ F) = 90°

Find : m (∠ E)



« 80° »

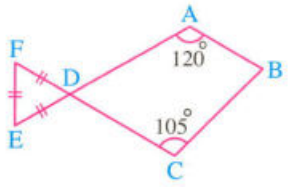
7 **In the opposite figure :**

$\overline{AE} \cap \overline{CF} = \{D\}$,

Δ DEF is an equilateral triangle ,

m (∠ A) = 120° and m (∠ C) = 105°

Find : m (∠ B)



« 75° »

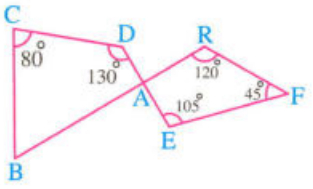
8 **In the opposite figure :**

$\overline{ED} \cap \overline{RB} = \{A\}$, m (∠ F) = 45° ,

m (∠ R) = 120° , m (∠ E) = 105° ,

m (∠ D) = 130° and m (∠ C) = 80°

Find : m (∠ B)



« 60° »

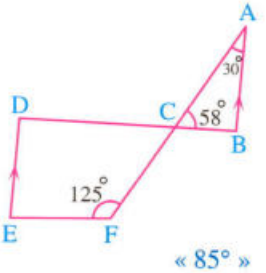
9 **In the opposite figure :**

$\overline{BD} \cap \overline{AF} = \{C\}$, $\overline{AB} \parallel \overline{ED}$,

m (∠ A) = 30° and m (∠ ACB) = 58° ,

m (∠ CFE) = 125°

Find : m (∠ E)



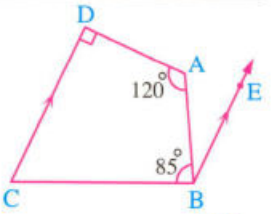
« 85° »

10 **In the opposite figure :**

m (∠ A) = 120° , m (∠ D) = 90° ,

m (∠ ABC) = 85° and $\overrightarrow{BE} \parallel \overline{CD}$

Find : m (∠ ABE)



« 30° »

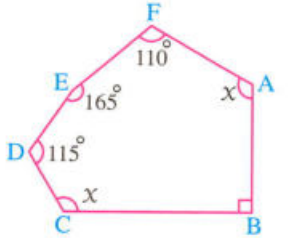
11 **In the opposite figure :**

ABCDEF is a hexagon.

m (∠ A) = m (∠ C)

Find :

The value of x



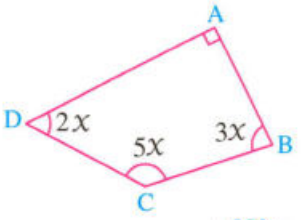
« 120° »

12 **In the opposite figure :**

ABCD is a quadrilateral

in which : m (∠ A) = 90°

Find : The value of X



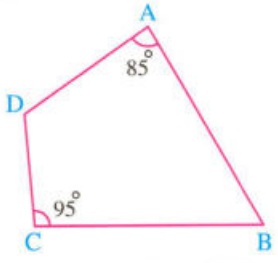
« 27° »

13 **In the opposite figure :**

m (∠ A) = 85° , m (∠ C) = 95°

and m (∠ B) = $\frac{1}{2}$ m (∠ D)

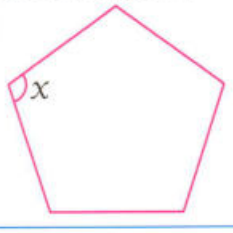
Find the measure of each of them.



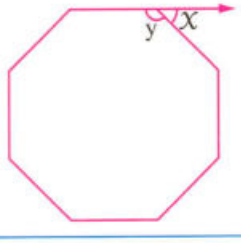
« 60° , 120° »

14 **In each of the following , if the polygon is regular , find the measures of the unknown angles :**

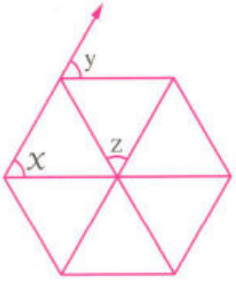
1



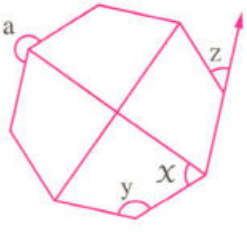
2



3

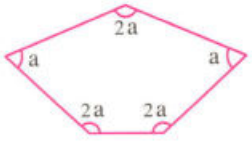


4

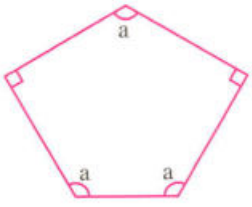


15 **In each of the following , find the values of the unknown symbols :**

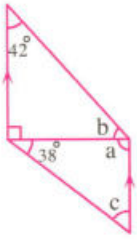
1



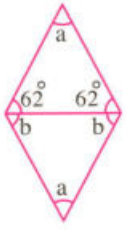
2



3



4

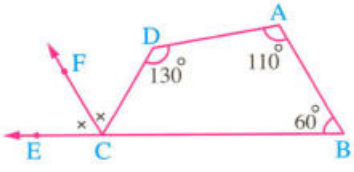


16 **In the opposite figure :**

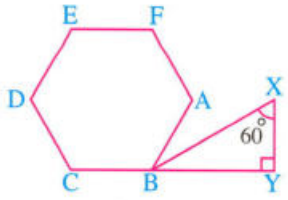
m (∠ A) = 110° , m (∠ B) = 60° ,

m (∠ D) = 130° , $\overrightarrow{CF}$ bisects ∠ DCE and C ∈ $\overrightarrow{BE}$

Prove that : $\overrightarrow{CF}$ // $\overline{AB}$



17 **In the opposite figure :**



ABCDEF is a regular hexagon ,

$Y \in \overrightarrow{CB}$, $\overline{XY} \perp \overline{YB}$ and $m(\angle X) = 60°$

Prove that : $\overrightarrow{BX}$ bisects $\angle ABY$

---

18 If the ratio among the measures of the angles of a pentagon is 3 : 3 : 2 : 3 : 4 , find the greatest measure of the angles of this pentagon. « 144° »

---

19 🕮 If the measure of the exterior angle of a regular polygon is 30° , how many sides does it have ? What is the sum of the measures of its interior angles ? « 12 , 1800° »

---

20 🕮 Is it possible that a regular polygon has an interior angle of measure 100° ? Why ?

---

21 A polygon of 9 sides. The sum of measures of eight angles of it is 1140°

1 Find the measure of the remained angle. « 120° »

2 Is it possible that this polygon is regular ? Explain your answer.

---

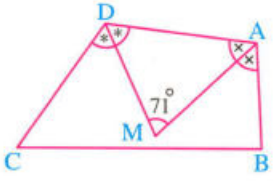
22 🕮 A polygon has 15 sides :

1 Calculate the sum of the measures of its interior angles. « 2340° »

2 If the sum of the measures of five of its exterior angles is 200° , calculate the sum of the measures of the ten interior angles which are not adjacent to the five exterior angles. « 1640° »

For excellent pupils

23 **In the opposite figure :**

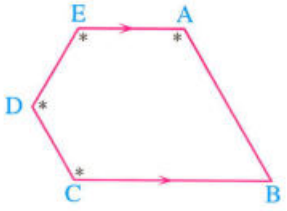


$\overrightarrow{AM}$ bisects $\angle BAD$, $\overrightarrow{DM}$ bisects $\angle ADC$ and $m(\angle AMD) = 71°$

Prove that : $m(\angle B) + m(\angle C) = 142°$

---

24 **In the opposite figure :**



$\overline{AE} // \overline{BC}$,

$m(\angle A) = m(\angle E) = m(\angle D) = m(\angle C)$

Find : $m(\angle B)$

« 60° »

Test 1

Total mark
10

Answer the following questions : (3 Marks)

1 Choose the correct answer from the given ones :

1 The number of diagonals of the pentagon is .....

(a) 5 (b) 9 (c) 15 (d) 2

2 If ABCD is a parallelogram , m (∠ B) + m (∠ C) = ...

(a) 70° (b) 180° (c) 90° (d) 360°

3 The parallelogram in which the two diagonals are equal in length is .....

(a) a trapezium. (b) a rhombus. (c) a rectangle. (d) a square.

2 Complete : (3 Marks)

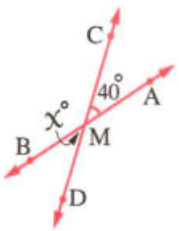
1 The sum of measures of the interior angles of the quadrilateral equals .....°

2 The measure of the exterior angle of the equilateral triangle at any one of its vertices equals .....

3 **In the opposite figure :**

If $\overleftrightarrow{AB} \cap \overleftrightarrow{CD} = \{M\}$

, then x = ... °



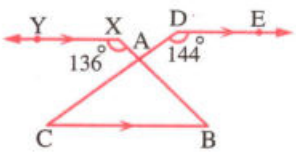
3 In the opposite figure : (2 Marks)

$\overline{BC} // \overrightarrow{DE} // \overrightarrow{XY}$

, m (∠ D) = 144°

, m (∠ X) = 136°

Find with proof : m (∠ BAC)

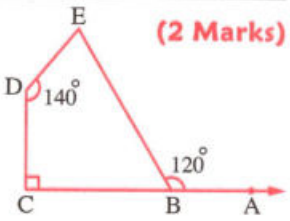


4 In the opposite figure : (2 Marks)

$A \in \overrightarrow{CB}$, m (∠ D) = 140°

, m (∠ ABE) = 120° , $\overline{DC} \perp \overline{CB}$

Find : m (∠ E)



Test 2

Total mark: 10

Answer the following questions : (3 Marks)

1 Choose the correct answer from the given ones :

1 In ΔXYZ : If $m(\angle X) = m(\angle Y) + m(\angle Z)$, then $\angle X$ is .....

(a) acute. (b) right. (c) obtuse. (d) straight.

2 The rhombus in which its two diagonals are equal in length is called .....

(a) a parallelogram. (b) a square.

(c) a rectangle. (d) a trapezium.

3 If two straight lines intersect , then each two vertically opposite angles are .....

(a) equal in measure. (b) complementary.

(c) supplementary. (d) adjacent.

2 Complete : (3 Marks)

1 The sum of measures of the exterior angle of a pentagon equals .....°

2 If ABCD is a parallelogram , $m(\angle C) = 70°$, then $m(\angle B)$ = ...°

3 The number of sides of a regular polygon in which the measure of one of its interior angles 108° is ..... sides.

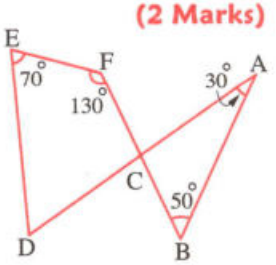
3 In the opposite figure : (2 Marks)

$\overline{AD} \cap \overline{BF} = \{C\}$

, $m(\angle A) = 30°$, $m(\angle B) = 50°$

, $m(\angle F) = 130°$, $m(\angle E) = 70°$

Find with proof : $m(\angle D)$



4 In the opposite figure : (2 Marks)

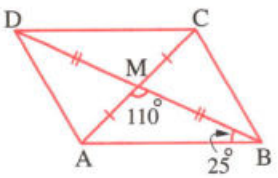
ABCD is a quadrilateral its two diagonals intersect at M

, $m(\angle AMB) = 110°$, $m(\angle MBA) = 25°$

, MA = MC , MB = MD

1 **Prove that :** ABCD is a parallelogram

2 **Find :** $m(\angle ACD)$



Test 1

Total mark 5

1 Choose the correct answer : (3 marks)

1 Twice the number 2^{20} is .....

ⓐ 2^{10} ⓑ 2^{19} ⓒ 2^{21} ⓓ 4^{20}

2 $\left(-\frac{3}{5}\right)^{-2}$ = ...

ⓐ $\frac{25}{9}$ ⓑ $\frac{-25}{9}$ ⓒ $\frac{-9}{25}$ ⓓ $\frac{9}{25}$

3 $(-4)^{\text{zero}}$ = ...

ⓐ 4 ⓑ -4 ⓒ 1 ⓓ -1

2 Simplify to the simplest form : $\frac{x^{-2} \times x^{7}}{x^{3}}$ where $x \neq$ zero (2 marks)

, then find the numerical value of the result when $x = 2$

Test 2

Total mark 5

1 Choose the correct answer : (3 marks)

1 $4^3 + 4^3 + 4^3 + 4^3$ = ...

ⓐ 12 ⓑ 48 ⓒ 4^4 ⓓ 4^{12}

2 If $x = \frac{1}{2}$, then x^{-3} = ...

ⓐ $\frac{1}{8}$ ⓑ $\frac{1}{6}$ ⓒ 8 ⓓ 6

3 $0.027 = \left(\frac{3}{10}\right)^{.....}$

ⓐ 4 ⓑ 3 ⓒ 2 ⓓ 1

2 Put the result in the simplest form : $\frac{3^{-2} \times 3^{7}}{3^{-3} \times 3^{6}}$ (2 marks)

Test 3

Total mark 5

1 Choose the correct answer : (3 marks)

1 Three times the number 3^4 is .....

ⓐ 3^{12} ⓑ 9^4 ⓒ 3^5 ⓓ 9^{12}

2 The additive inverse of the number $(-2)^3$ is .....

ⓐ 8 ⓑ -8 ⓒ $\frac{-1}{8}$ ⓓ $\frac{1}{6}$

3 If $a = 5^x$ and $b = 5^{-x}$, then $a \times b =$ .....

ⓐ 5^{2x} ⓑ 25^{2x} ⓒ zero ⓓ 1

2 If $x = -\frac{1}{2}$ and $y = \frac{2}{3}$ (2 marks)

Find the value of : $4x^2 + 27y^3$

Test 4

Total mark 5

1 Choose the correct answer : (3 marks)

1 $\left(\frac{1}{2}\right)^3 =$ .....

ⓐ 50 % ⓑ 12.5 % ⓒ 37.5 % ⓓ 12.5

2 $x^9 \div x^{-6} =$ ..... where $x \neq$ zero

ⓐ x^{-3} ⓑ x^3 ⓒ x^{-15} ⓓ x^{15}

3 If $a^{26} + a^{27} =$ zero , then $a =$ .....

ⓐ 1 ⓑ -1 ⓒ 2 ⓓ -2

2 Simplify to the simplest form : $\frac{(-4a^3b^4)^2}{(-2ab^2)^4}$ where $ab \neq$ zero (2 marks)

, then find the value of the result at $a = 2$ and $b = 1$

Test 5

Total mark 5

1 Choose the correct answer : (3 marks)

1 $2x^{-3} = \frac{2}{.....}$

ⓐ x^{-3} ⓑ x^{3} ⓒ x^{2} ⓓ x^{-2}

2 If $x = y$, then $\left(\frac{3}{5}\right)^{x-y}$ = ...

ⓐ zero ⓑ $\frac{3}{5}$ ⓒ $\frac{5}{3}$ ⓓ 1

3 $(0.\dot{3})^{-1} + (0.\dot{3})^{-1} + (0.\dot{3})^{-1}$ = ...

ⓐ 0.9 ⓑ – 0.9 ⓒ $\frac{1}{9}$ ⓓ 9

2 Calculate the value of : $\frac{(10)^4 \times (0.001)^2}{(10)^{-3}}$ (2 marks)

Test 1

Total mark 5

1 Choose the correct answer : (3 marks)

1 The number of diagonals of a regular pentagon is .....

ⓐ 3 ⓑ 5 ⓒ 7 ⓓ 8

2 The measure of the interior angle of the regular octagon is .....

ⓐ 108° ⓑ 120° ⓒ 135° ⓓ 144°

3 The sum of measures of the accumulative angles at a point is .....

ⓐ 90° ⓑ 180° ⓒ 270° ⓓ 360°

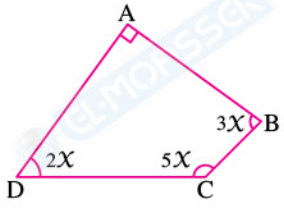
2 In the opposite figure : (2 marks)

ABCD is a quadrilateral in which

, m (∠ A) = 90° , m (∠ B) = 3 $\mathcal{X}$

, m (∠ C) = 5 $\mathcal{X}$ and m (∠ D) = 2 $\mathcal{X}$

Find : The value of $\mathcal{X}$



Test 2

Total mark 5

1 Choose the correct answer : (3 marks)

1 The sum of measures of the exterior angles of any convex polygon equals .....

ⓐ 720° ⓑ 360° ⓒ 180° ⓓ 270°

2 The sum of measures of the interior angles of a polygon of n sides equals .....

ⓐ n × 180° ⓑ (n – 2) × 180° ⓒ $\frac{(n-2)\times 180^\circ}{n}$ ⓓ $\frac{(n-2)\times 180^\circ}{2n}$

3 The measure of the interior angle of the regular pentagon is .....

ⓐ 135° ⓑ 540° ⓒ 108° ⓓ 110°

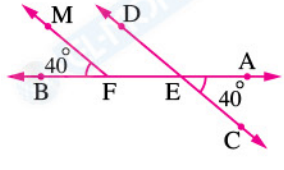
2 In the opposite figure : (2 marks)

$\overleftrightarrow{AB} \cap \overleftrightarrow{CD} = \{E\}$, $F \in \overleftrightarrow{AB}$

, m (∠ MFB) = 40° , m (∠ AEC) = 40°

1 **Find with proof :** m (∠ DEF)

2 **Prove that :** $\overleftrightarrow{DC} // \overleftrightarrow{FM}$



Test 3

Total mark 5

1 Choose the correct answer : (3 marks)

1 If the measure of an interior angle of a regular polygon is 135° , then the number of its sides is .....

(a) 6 (b) 4 (c) 7 (d) 8

2 If two straight lines intersect , then each two vertically opposite angles are .....

(a) corresponding. (b) equal in measure. (c) alternate. (d) interior.

3 The concave polygon has at least ..... angle.

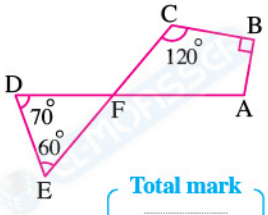
(a) an acute (b) a right (c) an obtuse (d) a reflex

2 In the opposite figure : (2 marks)

$\overline{AD} \cap \overline{CE} = \{F\}$, $m(\angle B) = 90°$

, $m(\angle C) = 120°$, $m(\angle E) = 60°$, $m(\angle D) = 70°$

Find : $m(\angle A)$



Test 4

Total mark 5

1 Choose the correct answer : (3 marks)

1 The measure of an exterior angle of a regular polygon is 40° , then the number of its sides is .....

(a) 4 (b) 5 (c) 6 (d) 9

2 The measure of the interior angle of a regular polygon of 10 sides equals .....

(a) 72° (b) 108° (c) 144° (d) 150°

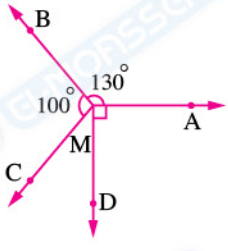
3 **In the opposite figure :**

If $m(\angle AMB) = 130°$, $m(\angle BMC) = 100°$

, $m(\angle AMD) = 90°$, then $m(\angle CMD)$ = ...

(a) 360° (b) 320°

(c) 40° (d) 140°

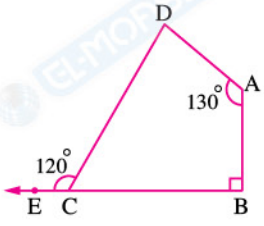


2 In the opposite figure : (2 marks)

ABCD is a quadrilateral in which

, $m(\angle B) = 90°$, $m(\angle A) = 130°$, $m(\angle DCE) = 120°$

Find with proof : $m(\angle D)$



Test 5

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 The polygon in which the sum of measures of its exterior angles equals the sum of measures of its interior angles is called .....

(a) triangle. (b) quadrilateral.

(c) pentagon. (d) hexagon.

2 The measure of the interior angle of the regular hexagon equals .....

(a) 60° (b) 108°

(c) 120° (d) 135°

3 A regular polygon of side length 5 cm. and the measure of its interior angle is 144° , then its perimeter = ... cm.

(a) 10 (b) 15

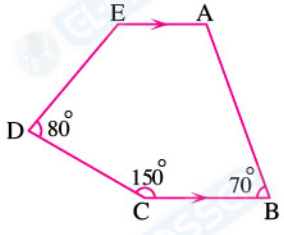
(c) 50 (d) 60

2 In the opposite figure : (2 marks)

$\overline{AE} // \overline{BC}$, m (∠ B) = 70°

, m (∠ C) = 150° , m (∠ D) = 80°

Find by proof : m (∠ E)



Answers of Test 1

1 1 (c) 2 (a) 3 (c)

2 $\frac{x^{-2} \times x^{7}}{x^{3}} = \frac{x^{-2+7}}{x^{3}} = \frac{x^{5}}{x^{3}} = x^{5-3} = x^{2}$

The numerical value of the result $= 2^{2} = 4$

Answers of Test 2

1 1 (c) 2 (c) 3 (b)

2 $\frac{3^{-2} \times 3^{7}}{3^{-3} \times 3^{6}} = \frac{3^{-2+7}}{3^{-3+6}} = \frac{3^{5}}{3^{3}} = 3^{5-3} = 3^{2} = 9$

Answers of Test 3

1 1 (c) 2 (a) 3 (d)

2 $4x^{2} + 27y^{3} = 4 \times \left(-\frac{1}{2}\right)^{2} + 27 \times \left(\frac{2}{3}\right)^{3} = 4 \times \frac{1}{4} + 27 \times \frac{8}{27} = 1 + 8 = 9$

Answers of Test 4

1 1 (b) 2 (d) 3 (b)

2 $\frac{(-4a^{3}b^{4})^{2}}{(-2ab^{2})^{4}} = \frac{(-4)^{2} \times a^{3\times2} \times b^{4\times2}}{(-2)^{4} \times a^{4} \times b^{2\times4}} = \frac{16a^{6}b^{8}}{16a^{4}b^{8}} = a^{6-4} = a^{2}$

The numerical value of result $= 2^{2} = 4$

Answers of Test 5

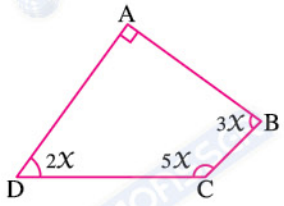
1 1 (b) 2 (d) 3 (d)

2 $\frac{(10)^{4} \times (10^{-3})^{2}}{(10)^{-3}} = \frac{(10)^{4} \times (10)^{-6}}{(10)^{-3}} = (10)^{4-6+3} = 10$

Answers of Test 1

1 1 (b) 2 (c) 3 (d)

2 ∵ The sum of the measures of the interior angles of the quadrilateral ABCD = 360°



∴ $3x + 5x + 2x + 90° = 360°$

∴ $10x + 90° = 360°$

∴ $10x = 360° - 90° = 270°$

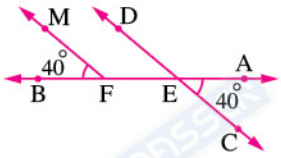
∴ $x = \frac{270°}{10} = 27°$ (The req.)

Answers of Test 2

1 1 (b) 2 (b) 3 (c)

2 ∵ $\overleftrightarrow{AB} \cap \overleftrightarrow{CD} = \{E\}$

∴ m (∠ DEF) = m (∠ AEC) = 40° (V.O.A.) (First req.)



∴ m (∠ DEF) = m (∠ MFB) = 40°

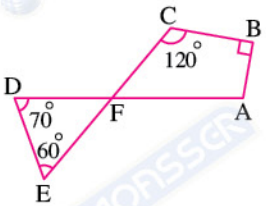
and they are two corresponding angles.

∴ $\overleftrightarrow{DC} // \overleftrightarrow{FM}$ (Second req.)

Answers of Test 3

1 1 (d) 2 (b) 3 (d)

2 In Δ DEF :



∵ m (∠ DEF) = 180° – (70° + 60°) = 50°

∴ $\overline{AD} \cap \overline{CE} = \{F\}$

∴ m (∠ AFC) = m (∠ DFE) = 50° (V.O.A.)

, ∵ the sum of the measures of the interior angles of the quadrilateral ABCF = 360°

∴ m (∠ A) = 360° – (120° + 90° + 50°) = 100° (The req.)

Answers of Test 4

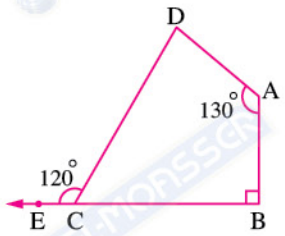
1 1 (d) 2 (c) 3 (c)

2 ∵ $E \in \overrightarrow{BC}$

∴ m (∠ DCB) = 180° – 120° = 60°

, ∵ the sum of the measures of the interior angles of the quadrilateral ABCD = 360°

∴ m (∠ D) = 360° – (60° + 90° + 130°) = 80° (The req.)



Answers of Test 5

1 1 (b) 2 (c) 3 (c)

2 ∵ $\overline{AE} \parallel \overline{BC}$, $\overleftrightarrow{AB}$ is a transversal to them.

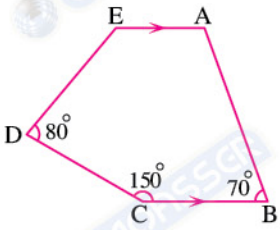
∴ m (∠ A) + m (∠ B) = 180°

(Two interior angles in the same side of the transversal)

∴ m (∠ A) = 180° – 70° = 110°

, ∵ the sum of the measures of the interior angles of the pentagon ABCDE = 540°

∴ m (∠ E) = 540° – (70° + 150° + 80° + 110°) = 130° (The req.)



Model (1)

10 Marks

1 Complete: (3)

a If $2^x = 3$, then the value of $4^x =$ .....

b If $\frac{x}{y} = -\frac{2}{3}$, then $\left(\frac{x}{y}\right)^3 =$ .....

c The additive inverse of the number $\left(\frac{3}{5}\right)^0$ is .....

2 Choose the correct answer: (3)

a $3^2 \times 3^5 =$ .....

1 3^{10} 2 3^7 3 3^5 4 3^{25}

b If $x = \frac{-1}{3}$ and $y = 3$, then $x^y =$ .....

1 $\frac{1}{27}$ 2 27 3 $\frac{-1}{27}$ 4 -27

c $2^2 + 2^2 =$ .....

1 2^4 2 2^5 3 2 4 2^3

3 Answer the following: (4)

a If $x = \frac{2}{3}$ and $y = \frac{-4}{3}$, find $\frac{x^3}{y^3}$

Solution:

.....

.....

b **Simplify:**

$\left(\frac{-2}{3}\right)^0 \times \left(\frac{-3}{5}\right)^2 \times \sqrt{\frac{25}{36}}$

Solution:

.....

.....

10 Marks

Model (2)

1 Complete: (3)

a If $2x = 6$, then $5x =$ .....

b If $x = 2^5 + 2^5$, $x =$ ..... = ...

c $36\% = \left(\frac{3}{5}\right)^{.....}$

2 Choose the correct answer: (3)

a The multiplicative inverse of the number $(-2)^3$ is .....

1 8 2 -8 3 $\frac{1}{8}$ 4 $\frac{-1}{8}$

b $\left(\frac{-3}{5}\right)^2 =$ .....

2 $\frac{9}{25}$ 2 $\frac{-25}{9}$ 3 $\frac{25}{9}$ 4 $\frac{-9}{25}$

c $3^x + 3^x + 3^x =$ .....

1 3^{3x} 2 3^{x+1} 3 3^{x-1} 4 1

3 Answer the following: (4)

a If $x = \frac{1}{2}$ and $y = \frac{-1}{4}$, find $x^4 - y^2$

Solution:

.....

.....

b **Simplify:**

$$\frac{3^3 \times 3^4}{(-3)^5}$$

Solution:

.....

.....

10 Marks

Model (3)

1 Complete:

3

a If $\left(\frac{5}{3}\right)^{x} = \frac{125}{27}$, then $x =$ .....

b If $3^{x} = 7^{x}$, then $5^{x} =$ .....

c The multiplicative inverse of 7^{1} is .....

2 Choose the correct answer:

3

a $\left(\frac{1}{2}\right)^{5} \div \left(\frac{1}{2}\right)^{3} =$ .....

$\left(\frac{1}{32}, \frac{1}{16}, \frac{1}{8}, \frac{1}{4}\right)$

b The quarter of 4^{12} is .....

$(4^{10}, 4^{3}, 4^{11}, 4^{8})$

c If $\left(\frac{2}{5}\right)^{2} \times y = \left(\frac{2}{5}\right)^{8}$, then $y =$ .....

$\left(\left(\frac{2}{5}\right)^{7}, \left(\frac{2}{5}\right)^{6}, \left(\frac{2}{5}\right)^{5}, \left(\frac{2}{5}\right)^{4}\right)$

3 Answer the following:

4

a If $x = \frac{-3}{2}$ and $y = \frac{1}{2}$, find the value of $\frac{x^2}{y^2}$

Solution:

.....

.....

b **Calculate the following:**

$\left(\left(\frac{2}{3}\right)^{2}\right)^{3} \times \left(\frac{3}{2}\right)^{5}$

Solution:

.....

.....

10 Marks

Model (4)

1 Complete: (3)

a If $\frac{x}{y} = \frac{-2}{3}$, then $\left(\frac{x}{y}\right)^3 =$ .....

b $7\,(13a)^{\text{zero}} =$ ..... (where $a \neq 0$)

c If $a^x = 2$, $a^y = 3$, then $a^{x+y} =$ ..... = ...

2 Choose the correct answer: (3)

a $(y^3 \times y^2)^2 =$ ..... $(y^5, y^{11}, y^8, y^{10})$

b The additive inverse of the number 3^2 is ..... $\left(9, \frac{1}{9}, \frac{-1}{9}, -9\right)$

c If $2^x = 5$, then $2^{x+1} =$ ..... $(10, 5, 32, 1)$

3 Answer the following: (4)

a **Calculate the following:**

$$\frac{(-3)^5 \times (-2)^7}{(-3)^3 \times (-2)^5}$$

Solution:

.....

.....

b If $a = \frac{-1}{2}$ and $b = \frac{2}{3}$, find a^3b^2

Solution:

.....

.....

10 Marks

Model (5)

1 Complete: (3)

a If $3^{2x} \times 9^{x} = 3^{\cdots\cdots}$

b If $x = 2^{5} + 2^{5}$, then $x = 2^{\cdots\cdots}$

c $((-1)^{3})^{2} - ((-1)^{3})^{4} =$ .....

2 Choose the correct answer: (3)

a $\frac{6a^{2}b^{4}}{2a^{3}b^{3}} =$ .....

1 $3a^{5}b^{7}$ 2 $\frac{3b}{a}$ 3 $3ab$ 4 $\frac{3}{ab}$

b $\left(\frac{-3}{5}\right)^{2} =$ .....

1 $\frac{9}{25}$ 2 $\frac{-25}{9}$ 3 $\frac{25}{9}$ 4 $\frac{-9}{25}$

c $3^{x} + 3^{x} + 3^{x} =$ .....

1 3^{3x} 2 3^{x+1} 3 3^{x-1} 4 1

3 Answer the following: (4)

a **Simplify:** $\frac{(2x)^{3} \times (2x)^{4}}{(-2x)^{6}}$, then find the value when $x = \frac{-1}{2}$

Solution:

.....

.....

b **Simplify:**

$\frac{3 \times 3^{7}}{(-3)^{5}}$

Solution:

.....

.....

10 Marks

Model (1)

1 Complete: (3)

a The sum of measures of the interior angles of the quadrilateral = ... °

b Any triangle has at least ..... acute angles.

c The sum of measures of the interior angles of pentagon equals ..... °

2 Choose the correct answer: (3)

a The measure of each angle of the regular hexagon is .....

(150° , 120° , 108° , 90°)

b The quadrilateral ABCD, if m(∠A) = 2m(∠B) = m(∠C) = 100,

then m(∠D) = ... (120°, 60°, 90°, 110°)

c The polygon which has a number of sides equals the number of diagonals is .....

(triangle , quadrilateral , pentagon , hexagon)

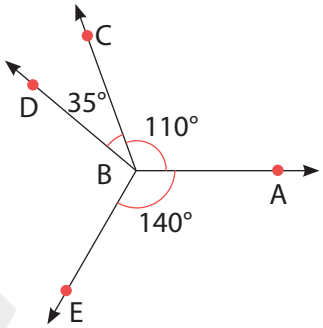
3 Answer the following: (4)

a **In the opposite figure:**

m(∠ABC) = 110°, m(∠CBD) = 35°

and m(∠ABE) = 140°,

find m(∠EBD)



Proof:

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b **In the opposite figure:**

ABCD is quadrilateral in which

m(∠A) = 90°

Find the value of x.

Proof:

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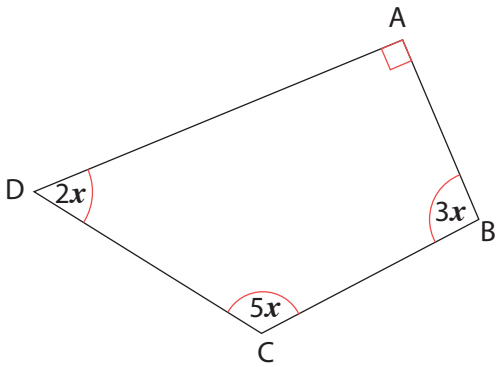


10 Marks

Model (2)

1 Complete:

3

a The sum of measures of the accumulative angles at a point is ..... °

b The obtuse-angled triangle has ..... acute angles.

c The perimeter of a regular hexagon is 48 cm, then its side length is ..... cm and the measure of each interior angle in it = ... °

2 Choose the correct answer:

3

a The sum of the measures of the exterior angles of a triangle = ...

(180° , 360° , 630° , 90°)

b The measure of the interior angle of the regular polygon of 10 sides equals .....

(72° , 108° , 144° , 150°)

c The measure of the interior angle of the regular octagon = ...

(1080° , 540° , 135° , 108°)

3 Answer the following:

4

a The length of the side of a regular pentagon is 6 cm.

Calculate:

1 Its perimeter.

2 The measure of each interior angle of it.

Solution:

.....

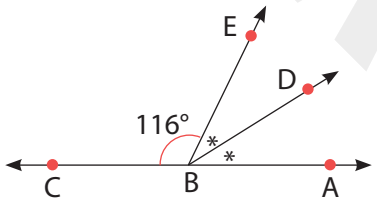
.....

b **In the opposite figure:**

B $\in$ ($\overleftrightarrow{AC}$), m(∠CBE) = 116°

and $\overrightarrow{BD}$ bisects ∠ABE

Find m(∠ABD)



Proof:

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10 Marks

Model (3)

1 Complete:

3

a If two straight lines intersect, then the measures of each two vertically opposite angles are ..... .

b The polygon which has no diagonals is ..... .

c Each line segment joining two non–adjacent vertices of the polygon is called a ..... .

2 Choose the correct answer:

3

a The sum of measures of the interior angles of a polygon of n sides equals .....

$(l \times 180°, (l - 2) \times 180°, \frac{l - 2 \times 180°}{2}, \frac{l - 2 \times 180°}{2l})$

b In triangle ABC, if $m(\angle B) = m(\angle A) + m(\angle C)$, then $m(\angle B) =$ .....

$(45°, 90°, 30°, 60°)$

c The measure of the interior angle of a polygon with 8 sides = ...

$(108°, 135°, 144°, 120°)$

3 Answer the following:

4

a ABCDE is a pentagon:
if $m(\angle A) = 110°$, $m(\angle B) = 120°$,
$m(\angle E) = 115°$ and $m(\angle D) = 90°$, Find $m(\angle C)$.

Solution:

.....

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b If the measure of the exterior angle of a regular polygon is 30°, how many sides does it have? What is the sum of the measures of its interior angles?

Solution:

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10 Marks

Model (4)

1 Complete:

3

a XYZL is a parallelogram, m(∠ X) = 70°, then m(∠ L) = ... °

b The sum of measures of the interior angles of a polygon of n sides equals

.....

c If the measures of two angles in a triangle are 50°, 60°, then the triangle is a/an

..... triangle.

2 Choose the correct answer:

3

a In Δ ABC, if m(∠ A) = 60°, m(∠ B) = 2 m(∠ C), then m(∠ B) = ...

(80° , 70° , 60° , 40°)

b The measure of the interior angle of a regular polygon of 18 sides equals .....

(160° , 150° , 140° , 130°)

c The number of the diagonals of the pentagon = ... (0 , 2 , 5 , 10)

3 Answer the following:

4

a If the sum of measures of the interior angles of a polygon is 1620°,

find the number of sides.

Solution:

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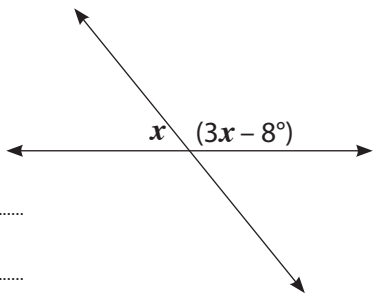
b **In the opposite figure:**

What is the value of x?

Solution:



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10 Marks

Model (5)

1 Complete: (3)

a The sum of measures of the interior angles of the triangle = ... °

b The rhombus which has a right angle is ..... .

c The sum of measures of the accumulative angles at a point is ..... °

2 Choose the correct answer: (3)

a The number of diagonals of the quadrilateral = ... (3 , 4 , 5 , 2)

b The quadrilateral which has two only parallel sides is called .....

(parallelogram , rhombus , trapezium , rectangle)

c The measures of the interior angle of a regular polygon of n sides equal .....

$\left(\frac{(l-2)\times 90^\circ}{l}, \frac{(l-2)\times 180^\circ}{2}, \frac{(l-2)\times 180^\circ}{l}, 180^\circ \times (l-1)\right)$

3 Answer the following: (4)

a If the ratio among the measures of the angles of a pentagon is 3 : 3 : 2 : 3 : 4, find the greatest measure of the angles of this pentagon.

Solution:

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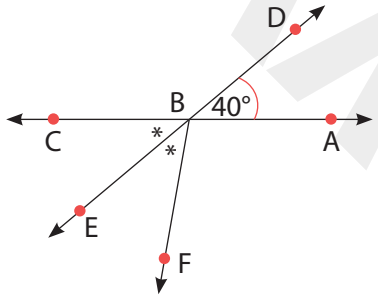
b **In the opposite figure:**

$(\overleftrightarrow{AC}) \cap (\overleftrightarrow{DE}) = \{B\}$, $m(\angle ABD) = 40^\circ$

and $(\overrightarrow{BE})$ bisects $\angle CBF$

Find $m(\angle ABF)$



Proof:

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10 Marks

Model (1)

1 Complete: (3)

a If $2^x = 3$, then the value of $4^x = 9$

b If $\frac{x}{y} = -\frac{2}{3}$, then $\left(\frac{x}{y}\right)^3 = -\frac{8}{27}$

c The additive inverse of the number $\left(\frac{3}{5}\right)^0$ is -1

2 Choose the correct answer: (3)

a $3^2 \times 3^5 =$ .....

1 3^{10} 2 3^7 3 3^5 4 3^{25}

b If $x = \frac{-1}{3}$ and $y = 3$, then $x^y =$ .....

1 $\frac{1}{27}$ 2 27 3 $\frac{-1}{27}$ 4 -27

c $2^2 + 2^2 =$ .....

1 2^4 2 2^5 3 2 4 2^3

3 Answer the following: (4)

a If $x = \frac{2}{3}$ and $y = \frac{-4}{3}$, find $\frac{x^3}{y^3}$

Solution:

$x^3 \div y^3 = \left(\frac{2}{3}\right)^3 \div \left(\frac{-4}{3}\right)^3 = \frac{8}{27} \div \frac{-64}{27}$

$= \frac{8}{27} \times \frac{-27}{64} = \frac{-1}{8}$

b **Simplify:**

$\left(\frac{-2}{3}\right)^0 \times \left(\frac{-3}{5}\right)^2 \times \sqrt{\frac{25}{36}}$

Solution:

$1 \times \frac{9}{25} \times \frac{5}{6} = \frac{3}{10}$

10 Marks

Model (2)

1 Complete: (3)

a If $2x = 6$, then $5x = 15$

b If $x = 2^5 + 2^5$, $x = 2 \times 2^5 = 2^6$

c $36\% = \left(\frac{3}{5}\right)^2$

2 Choose the correct answer: (3)

a The multiplicative inverse of the number $(-2)^3$ is .....

1 8 2 -8 3 $\frac{1}{8}$ 4 $\frac{-1}{8}$

b $\left(\frac{-3}{5}\right)^2 =$ .....

2 $\frac{9}{25}$ 2 $\frac{-25}{9}$ 3 $\frac{25}{9}$ 4 $\frac{-9}{25}$

c $3^x + 3^x + 3^x =$ .....

1 3^{3x} 2 3^{x+1} 3 3^{x-1} 4 1

3 Answer the following: (4)

a If $x = \frac{1}{2}$ and $y = \frac{-1}{4}$, find $x^4 - y^2$

Solution:

$x^4 - y^2 = \left(\frac{1}{2}\right)^4 - \left(\frac{-1}{4}\right)^2 = \frac{1}{16} - \frac{1}{16} = 0$

b **Simplify:**

$\frac{3^3 \times 3^4}{(-3)^5}$

Solution:

$\frac{3^3 \times 3^4}{(-3)^5} = \frac{3^{3+4}}{(-3)^5} = \frac{-3^7}{(3)^5} = -3^2 = -9$

10 Marks

Model (3)

1 Complete: (3)

a If $\left(\frac{5}{3}\right)^{x} = \frac{125}{27}$, then $x = 3$

b If $3^{x} = 7^{x}$, then $5^{x} = 1$

c The multiplicative inverse of 7^{1} is $\frac{1}{7}$

2 Choose the correct answer: (3)

a $\left(\frac{1}{2}\right)^{5} \div \left(\frac{1}{2}\right)^{3} =$ ..... $\left(\frac{1}{32}, \frac{1}{16}, \frac{1}{8}, \frac{1}{4}\right)$

b The quarter of 4^{12} is ..... $(4^{10}, 4^{3}, 4^{11}, 4^{8})$

c If $\left(\frac{2}{5}\right)^{2} \times y = \left(\frac{2}{5}\right)^{8}$, then $y =$ ..... $\left(\left(\frac{2}{5}\right)^{7}, \left(\frac{2}{5}\right)^{6}, \left(\frac{2}{5}\right)^{5}, \left(\frac{2}{5}\right)^{4}\right)$

3 Answer the following: (4)

a If $x = \frac{-3}{2}$ and $y = \frac{1}{2}$, find the value of $\frac{x^2}{y^2}$

Solution:

$$\frac{x^2}{y^2} = \left(\frac{-3}{2}\right)^{2} \div \left(\frac{1}{2}\right)^{2} = \frac{9}{4} \div \frac{1}{4} = \frac{9}{4} \times 4 = 9$$

b **Calculate the following:**

$$\left(\left(\frac{2}{3}\right)^{2}\right)^{3} \times \left(\frac{3}{2}\right)^{5}$$

Solution:

$$\left(\left(\frac{2}{3}\right)^{2}\right)^{3} \times \left(\frac{3}{2}\right)^{5} = \left(\frac{2}{3}\right)^{6} \times \left(\frac{3}{2}\right)^{5} = \frac{2^6}{3^6} \times \frac{3^5}{2^5} = \frac{2}{3}$$

10 Marks

Model (4)

1 Complete: (3)

a If $\frac{x}{y} = \frac{-2}{3}$, then $\left(\frac{x}{y}\right)^3 = \frac{-8}{27}$

b $7\,(13a)^{\text{zero}} = 7$ (where $a \neq 0$)

c If $a^x = 2$, $a^y = 3$, then $a^{x+y} = 2 \times 3 = 6$

2 Choose the correct answer: (3)

a $(y^3 \times y^2)^2 =$ ..... $(y^5, y^{11}, y^8, y^{10})$

b The additive inverse of the number 3^2 is ..... $\left(9, \frac{1}{9}, \frac{-1}{9}, -9\right)$

c If $2^x = 5$, then $2^{x+1} =$ ..... $(10, 5, 32, 1)$

3 Answer the following: (4)

a **Calculate the following:**

$$\frac{(-3)^5 \times (-2)^7}{(-3)^3 \times (-2)^5}$$

Solution:

$(-3)^{5-3} \times (-2)^{7-5} = (-3)^2 \times (-2)^2 = 9 + 4 = 13$

b If $a = \frac{-1}{2}$ and $b = \frac{2}{3}$, find $a^3 b^2$

Solution:

$a^3 b^2 = \left(\frac{-1}{2}\right)^3 \times \left(\frac{2}{3}\right)^2 = \frac{-1}{8} \times \frac{4}{9} = \frac{-1}{2} \times \frac{1}{9} = \frac{-1}{18}$

10 Marks

Model (5)

1 Complete:

3

a If $3^{2x} \times 9^{x} = 3^{4x}$

b If $x = 2^{5} + 2^{5}$, then $x = 2^{6}$

c $((-1)^{3})^{2} - ((-1)^{3})^{4} = 0$

2 Choose the correct answer:

3

a $\frac{6a^{2}b^{4}}{2a^{3}b^{3}} =$ .....

1 $3a^{5}b^{7}$ 2 $\frac{3b}{a}$ 3 $3ab$ 4 $\frac{3}{ab}$

b $\left(\frac{-3}{5}\right)^{2} =$ .....

1 $\frac{9}{25}$ 2 $\frac{-25}{9}$ 3 $\frac{25}{9}$ 4 $\frac{-9}{25}$

c $3^{x} + 3^{x} + 3^{x} =$ .....

1 3^{3x} 2 3^{x+1} 3 3^{x-1} 4 1

3 Answer the following:

4

a **Simplify:** $\frac{(2x)^{3} \times (2x)^{4}}{(-2x)^{6}}$, then find the value when $x = \frac{-1}{2}$

Solution:

$$\frac{(2x)^{3} \times (2x)^{4}}{(-2x)^{6}} = \frac{(2x)^{3} \times (2x)^{4}}{(2x)^{6}} = (2x)^{3+4-6} = 2x = 2 \times \frac{-1}{2} = -1$$

b **Simplify:**

$$\frac{3 \times 3^{7}}{(-3)^{5}}$$

Solution:

$$\frac{3 \times 3^{7}}{(-3)^{5}} = \frac{3^{1+7}}{(-3)^{5}} = \frac{-3^{8}}{(3)^{5}} = -3^{3} = -27$$

10 Marks

Model (1)

1 Complete: (3)

a The sum of measures of the interior angles of the quadrilateral = **360°**

b Any triangle has at least **two** acute angles.

c The sum of measures of the interior angles of pentagon equals **540°**

2 Choose the correct answer: (3)

a The measure of each angle of the regular hexagon is .....

(150° , **120°** , 108° , 90°)

b The quadrilateral ABCD, if m(∠A) = 2m(∠B) = m(∠C) = 100,

then m(∠D) = ... (120°, 60°, 90°, **110°**)

c The polygon which has a number of sides equals the number of diagonals is .....

(triangle , quadrilateral , **pentagon** , hexagon)

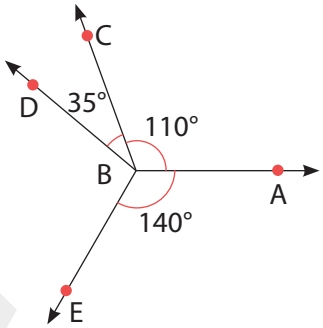
3 Answer the following: (4)

a **In the opposite figure:**

m(∠ABC) = 110°, m(∠CBD) = 35°

and m(∠ABE) = 140°,

find m(∠EBD)



Proof:

∵ m(∠EBD) + m(∠CBD) + m(∠ABC) + m(∠ABE) = 360°

∴ m(∠EBD) + 35° + 110° + 140° = 360°

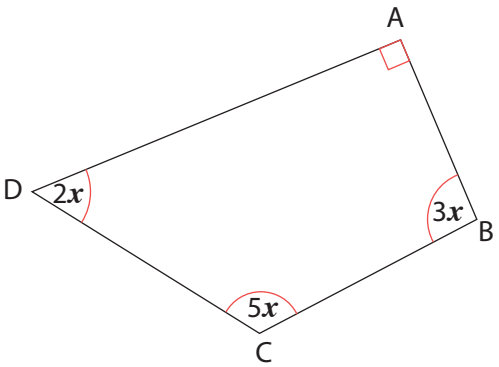
∴ m(∠EBD) = 360° – 285° = 75°

b **In the opposite figure:**

ABCD is quadrilateral in which

m(∠A) = 90°

Find the value of x.



Proof:

From the quadrilateral ABCD

∵ m(∠A) + m(∠B) + m(∠C) + m(∠D) = 360°

∴ 90° + 3x + 5x + 2x = 360°

∴ 10x = 360° – 90°

∴ 10x = 270°

∴ x = 27°

10 Marks

Model (2)

1 Complete: (3)

a The sum of measures of the accumulative angles at a point is **360°**.

b The obtuse-angled triangle has **two** acute angles.

c The perimeter of a regular hexagon is 48 cm, then its side length is **8** cm and the measure of each interior angle in it = **120°**

2 Choose the correct answer: (3)

a The sum of the measures of the exterior angles of a triangle = ...

(180° , **360°** , 630° , 90°)

b The measure of the interior angle of the regular polygon of 10 sides equals .....

(72° , 108° , **144°** , 150°)

c The measure of the interior angle of the regular octagon = ...

(1080° , 540° , **135°** , 108°)

3 Answer the following: (4)

a The length of the side of a regular pentagon is 6 cm.

Calculate:

1 Its perimeter.

2 The measure of each interior angle of it.

Solution:

The perimeter = $6 \times 5 = 30$ cm

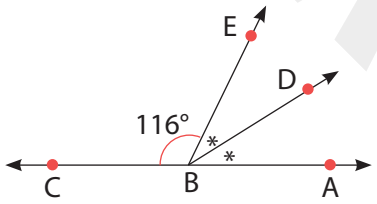
The measure of each angle = $\frac{(5-2) \times 180°}{5} = 108°$

b **In the opposite figure:**

$B \in (\overleftrightarrow{AC})$, $m(\angle CBE) = 116°$

and $\overrightarrow{BD}$ bisects $\angle ABE$

Find $m(\angle ABD)$



Proof:

$\because B \in \overleftrightarrow{AC}$

$\therefore m(\angle ABE) + m(\angle CBE) = 180°$

$\therefore m(\angle ABE) = 180° - 116° = 64°$

$\because \overrightarrow{BD}$ bisect $\angle ABE$

$\therefore m(\angle ABD) = m(\angle DBE) = \frac{64°}{2} = 32°$

10 Marks

Model (3)

1 Complete: (3)

a If two straight lines intersect, then the measures of each two vertically opposite angles are **equal in measure**.

b The polygon which has no diagonals is **the triangle**.

c Each line segment joining two non–adjacent vertices of the polygon is called a **diagonal**.

2 Choose the correct answer: (3)

a The sum of measures of the interior angles of a polygon of n sides equals .....

($n \times 180°$, $(n-2) \times 180°$, $\frac{n-2\times180°}{2}$, $\frac{n-2\times180°}{2n}$)

b In triangle ABC, if m(∠B) = m(∠A) + m(∠C), then m(∠B) = ...

(45° , **90°** , 30° , 60°)

c The measure of the interior angle of a polygon with 8 sides = ...

(108° , **135°** , 144° , 120°)

3 Answer the following: (4)

a ABCDE is a pentagon:

if m(∠A) = 110°, m(∠B) = 120°,

m(∠E) = 115° and m(∠D) = 90°, Find m(∠C).

Solution:

∵ ABCDE is a pentagon

∴ The sum measures of the interior angle in it = (5 – 2) x 180° = 540°

∴ m(∠C) = 540° – (110° + 120° + 115° + 90°)

= 540° – 435° = 105°

b If the measure of the exterior angle of a regular polygon is 30°, how many sides does it have? What is the sum of the measures of its interior angles?

Solution:

∵ The measure of exterior angle of the polygon = 30°

∴ The measure of the interior angle of the polygon = 180° – 30° = 150°

∴ $\frac{(n-2)\times180°}{2} = 150°$

∴ $180° n - 360° = 150° n$

∴ $30° n = 360°$

∴ $n = \frac{360°}{30°} = 12$

∴ The sum of measures of the interior angles = (12 – 2) × 180° = 1800°

10 Marks

Model (4)

1 Complete:

3

a XYZL is a parallelogram, m(∠ X) = 70°, then m(∠ L) = **110°**

b The sum of measures of the interior angles of a polygon of n sides equals **$(n - 2) \times 180°$**

c If the measures of two angles in a triangle are 50°, 60°, then the triangle is a/an **acute** triangle.

2 Choose the correct answer:

3

a In Δ ABC, if m(∠ A) = 60°, m(∠ B) = 2 m(∠ C), then m(∠ B) = ...

(**80°** , 70° , 60° , 40°)

b The measure of the interior angle of a regular polygon of 18 sides equals .....

(**160°** , 150° , 140° , 130°)

c The number of the diagonals of the pentagon = ... (0 , 2 , **5** , 10)

3 Answer the following:

4

a If the sum of measures of the interior angles of a polygon is 1620°, find the number of sides.

Solution:

∵ The sum of measures of the interior angles of a polygon of n sides equals $(n-2) \times 180°$

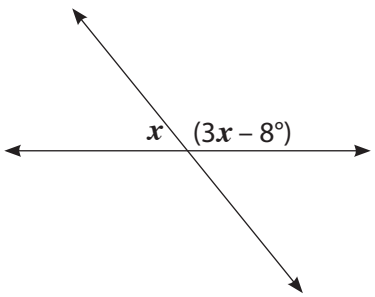
∴ $1620° = (n - 2) \times 180°$

∴ $n - 2 = \frac{1620°}{180°}$, $n - 2 = 9$, ∴ $n = 11$

∴ the number of sides of the polygon is 11 sides

b **In the opposite figure:**

What is the value of x?



Solution:

∵ $x + 3x - 8 = 180°$

∴ $4x - 8° = 180°$

∴ $4x = 188°$

∴ $x = 47°$

10 Marks

Model (5)

3

1 Complete:

a The sum of measures of the interior angles of the triangle = **180°**.

b The rhombus which has a right angle is **square**.

c The sum of measures of the accumulative angles at a point is **360°**.

3

2 Choose the correct answer:

a The number of diagonals of the quadrilateral = ... (3 , 4 , 5 , **2**)

b The quadrilateral which has two only parallel sides is called .....

(parallelogram , rhombus , **trapezium** , rectangle)

c The measures of the interior angle of a regular polygon of n sides equal .....

($\frac{(n-2)\times 90°}{n}$, $\frac{(n-2)\times 180°}{2}$, $\frac{(n-2)\times 180°}{n}$, $180° \times (n - 1)$)

4

3 Answer the following:

a If the ratio among the measures of the angles of a pentagon is 3 : 3 : 2 : 3 : 4, find the greatest measure of the angles of this pentagon.

Solution:

∵ Let the measure of the interior angles of the pentagon be $3x$, $3x$, $2x$, $3x$, $4x$

∴ The sum of the measures of the interior angles of the pentagon

$= (5 - 2) \times 180° = 540°$

∴ $3x + 3x + 2x + 3x + 4x = 540°$

∴ $15x = 540$

∴ $x = \frac{540}{15} = 36°$

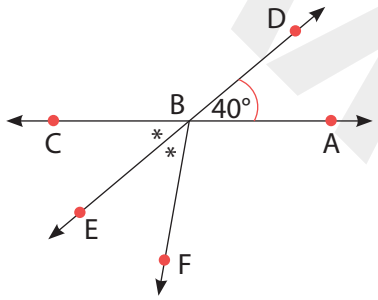
∴ The greatest measure $= 4 \times 36° = 144°$

b **In the opposite figure:**

$(\overleftrightarrow{AC}) \cap (\overleftrightarrow{DE}) = \{B\}$, $m(\angle ABD) = 40°$

and $(\overrightarrow{BE})$ bisects $\angle CBF$

Find $m(\angle ABF)$



Proof:

∵ $(\overleftrightarrow{AC}) \cap (\overleftrightarrow{DE}) = \{B\}$

∴ $m(\angle CBE) = m(\angle ABD) = 40°$ (V.O.A)

∵ $(\overrightarrow{BE})$ bisects $\angle CBF$

∴ $m(\angle FBE) + m(\angle EBC) = 80°$

∴ $m(\angle FBC) = 80°$

∵ $B \in \overleftrightarrow{AC}$

∴ $m(\angle ABF) = 180° - 80° = 100°$

FIRST ALGERBA

Q1: Choose the correct answer:

1 The additive inverse of the number $(-5)^0$ is .....

(a) 1 (b) -5 (c) 5 (d) $-(7)^0$

2 The multiplicative inverse of the number $(-1)^{45}$ is .....

(a) $(-1)^{43}$ (b) $(-1)^{44}$ (c) $(1)^{43}$ (d) $(1)^{44}$

3 If a = b, then $(\frac{x}{3y})^{b-a}$ = ...

(a) $\frac{x}{3y}$ (b) $\frac{3y}{x}$ (c) 1 (d) zero

4 $(-\frac{3}{5})^{-3}$ = ...

(a) $\frac{-27}{125}$ (b) $-\frac{125}{27}$ (c) $\frac{27}{125}$ (d) $\frac{125}{27}$

5 $(\frac{a}{b})^5 \times \frac{b^5}{a^5}$ = ... (where $a \neq$ zero , $b \neq$ zero)

(a) $(\frac{a}{b})^{10}$ (b) $\frac{a}{b}$ (c) ab (d) $(xy)^{zero}$

6 If $y^{22} + y^{23} = 0$, then y = ...

(a) -1 (b) 1 (c) 2 (d) -2

7 $4^{10} + 4^{10} + 4^{10} + 4^{10}$ = ...

(a) 4^{10} (b) 4^{40} (c) 2^9 (d) 4^{11}

8 Half of 4^{20} = ...

(a) 4^{10} (b) 2^{39} (c) 2^{20} (d) 4^{19}

9 Third of 3^{30} = ...

(a) 3^{10} (b) 3^{29} (c) 9^{10} (d) 3^{15}

10 $\frac{(x^2)^3}{x^3}$ = ... ($x \neq$ zero)

(a) x^6 (b) x^2 (c) x^3 (d) x

11 $(2x)^4$ = ...

(a) $2x^4$ (b) 16 x (c) $16x^4$ (d) $16x^2$

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12 If $3^x = 7$, then a^{x+1} = ...

(a) 49 (b) 9 (c) 21 (d) 8

13 $(\frac{2}{3})^{-2}$ = ...

(a) $\frac{-9}{4}$ (b) $\frac{-4}{9}$ (c) $\frac{4}{9}$ (d) $\frac{9}{4}$

14 $\frac{(-2s^2t)^3}{(-4st^2)^2}$ = ...

(a) $\frac{-s^3}{2t}$ (b) $\frac{-s^4}{2t}$ (c) $\frac{s^5}{2t^2}$ (d) $\frac{s^4}{t}$

15 $4^{-1} + 4^{-1} + 4^{-1} + 4^{-1}$ = ...

(a) 4^{-4} (b) 4^4 (c) 1 (d) 16

16 If $xy^{-1} = \frac{1}{3}$, then $\frac{y}{x}$ = ...

(a) $\frac{1}{3}$ (b) 1 (c) $-\frac{1}{3}$ (d) 3

17 $\frac{3^x}{3^{-y}}$ = ...

(a) $-\frac{x}{y}$ (b) $3^{x \div y}$ (c) 3^{x+y} (d) 3^{x-y}

18 The greatest value of $(\frac{1}{8})^m$, when m = ...

(a) – 1 (b) zero (c) 1 (d) 100

Q2: Complete the following:

1 If $\frac{x}{y} = \frac{5}{7}$, then $\frac{7x}{5y}$ = ...

2 $2^2 + 2^2 = 2^{.....}$

3 $2\frac{1}{4} = (\frac{3}{2})^{.....}$

4 $3^x = 7$, then 3^{x+2} = ...

5 $9x^{-3} = \frac{9}{....}$

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FIRST ALGERBA

6 If $x = \frac{2}{5}$, and $y = \frac{5}{6}$, then x^2y^2 = ...

7 $(\frac{3}{5})^5)^3 = \frac{3^{15}}{....}$

8 If $(\frac{3}{5})^3 \times y = (\frac{3}{5})^6$, then the value of y = ...

9 $(\frac{3^{-1}}{5})^2$ = ...

10 $\frac{x^{-7}}{y^{-7}} = (.....)^7$

11 $3^{10} \times 3^{-10} = 9^{.....}$

12 $y^{-7} + 1 = y^{-7}$ (..... + ...) where $y \neq 0$

Q3: Answer the following:

1 Calculate the following:

A] $\left(\frac{3^4 \times 7^3}{7^4 \times 3^3}\right)^{-1}$ B] $(7^0 \times 2^{-2})^{-3}$ C] $\frac{8 \times 8^{-3}}{8^{-4}}$

2 If $x = \frac{2}{3}$, and $y = -\frac{1}{2}$, Find the value of: x^2y^2 and $(a - b)^{-1}$

.....

3 Simplify: $\frac{x^3 \times x^{-2}}{x^{-5} \times x}$, Then find the numerical value of the result when: x = –2

.....

4 Simplify to the simplest form : $\frac{2^{10} \times 3^4}{12^5}$

.....

5 Prove that: $4^{y+2} - 4^{y+1} = 12 \times 4^y$

.....

6 If $x = -\frac{1}{2}$, $y = -\frac{3}{4}$, Find in the simplest form: $(\frac{y}{x^2})^{-2}$

.....

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SECOND GEOMETRY

Q1: Choose the correct answer:

1. The measure of an interior angle of regular pentagon is .....
   (a) 540 ° (b) 120 ° (c) 108 ° (d) 72 °
2. The sum of measures of the interior angles of any quadrilateral equals .....
   (a) 360 ° (b) 720 ° (c) 540 ° (d) 180 °
3. The sum of measures of the accumulative angles at a point equals .....
   (a) 360 ° (b) 90 ° (c) 540 ° (d) 180 °
4. The measure of the interior angle of the equilateral triangle is .....
   (a) 120 ° (b) 60 ° (c) 180 ° (d) 72 °
5. The measure of the interior angle of the regular pentagon = ...
   (a) 72 ° (b) 60 ° (c) 120 ° (d) 135 °
6. The number of diagonal of triangle is .....
   (a) 3 (b) 2 (c) 1 (d) zero
7. The number of diagonal of heptagon is .....
   (a) 7 (b) 5 (c) 9 (d) 14
8. The measure of the interior angle of the regular polygon of 12 sides equals .....
   (a) 72 ° (b) 120 ° (c) 135 ° (d) 150 °
9. If the measure of an interior angle of a regular polygon is 160°,
   then the number of its sides is .....
   (a) 18 (b) 16 (c) 14 (d) 12
10. In the quadrilateral ABCD, If m($\angle$A) = 3 m ($\angle$B) = m($\angle$C) = 120° ,
    then m($\angle$D) = ...
    (a) 60 ° (b) 40 ° (c) 80 ° (d) 160 °
11. The number of axes of symmetry of isosceles triangle is .....
    (a) 0 (b) 1 (c) 2 (d) 3
12. The polygon which number of its diagonal equal to number of its side is .....
    (a) quadrilateral (b) pentagon (c) hexagon (d) triangle

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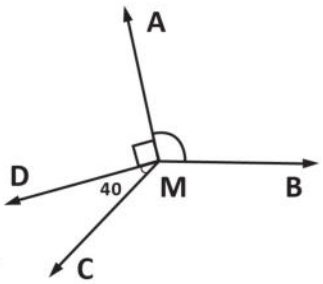
SECOND GEOMETRY

Q2: Complete the following:

1. The perimeter of hexagon is 48 cm, then its side length is ..... cm
2. The sum of the interior angles of any triangle is .....
3. The meseaure of an interior angle of regular octagon is .....
4. If the perimeter of regular pentagon is 42 cm, then its side length is .....
5. The number of axes of symmetry of square is .....
6. In any triangle, there are at least two ..... angles.
7. Each line segement joining between two non-adjacent vertices of the polygon is called .....
8. The sum of measures of the interior angles of the heptagon = ...
9. The polygon which has no diagonal is .....
10. The polygon which the measure of its interior angle is 108 ° is .....

Q3: Answer the following:

1. In opposite figure:
   $m(\angle AMB) = 110^\circ$, $m(\angle AMD) = 90^\circ$
   $m(\angle DMC) = 40^\circ$
   Find: $m(\angle BMC)$



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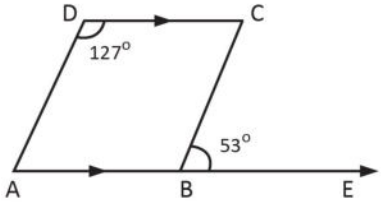
2. In the opposite figure:
   AB // DC, $m(\angle EBC) = 53^\circ$, $m(\angle D) = 127^\circ$,
   Prove that: BC // AD



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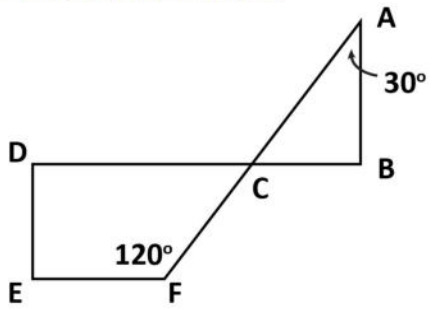
SECOND GEOMETRY

3 $AB \perp BC$, $BD \cap AF = \{C\}$,
$m(\angle A) = 30^\circ$, $m(\angle D) = 90^\circ$,
,$m(\angle F) = 120^\circ$
Find with proof: $m(\angle E)$



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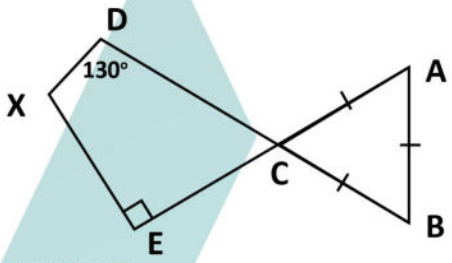
4 Δ ABC is an equilateral triangle
$BD \cap AE = \{C\}$, $m(\angle D) = 130^\circ$
$m(\angle E) = 90^\circ$.
Find by proof: $m(\angle X)$



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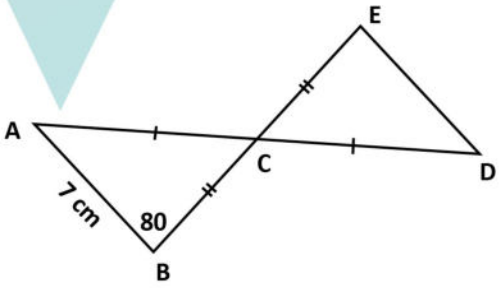
5 In the opposite figure:
$AD \cap BE = \{C\}$, $AC = CD$, $BC = CE$
$AB = 7$ cm, $m(\angle B) = 80^\circ$

1) Is Δ ABC ≡ Δ DEC? why?
2) Find: The length of ED, $m(\angle E)$



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اللهم اجعل هذا العمل خالصا لوجهك الكريم واكتب له القبول
والنفع يا كريم يا وهّاب.

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1. Choose the correct answer:

1 The sum of measures of the interior angles of a polygon of n sides equals .....

(a) $n \times 180°$ (b) $(n-2) \times 180°$ (c) $\frac{(n-2) \times 180°}{2}$ (d) $\frac{(n-2) \times 180°}{2n}$

2 The measure of the interior angle of a regular polygon of n sides equals .....

(a) $\frac{(n-2) \times 90°}{n}$ (b) $\frac{(n-2) \times 180°}{2}$ (c) $\frac{(n-2) \times 180°}{n}$ (d) $180° \times (n-1)$

3 The measure of the interior angle of the regular polygon of 10 sides equals .....

(a) 72° (b) 108° (c) 144° (d) 150°

4 The measure of the interior angle of a regular polygon of 18 sides equals .....

(a) 130° (b) 140° (c) 150° (d) 160°

5 If the measure of an interior angle of a regular polygon is 135° , then the number of its sides is .....

(a) 6 (b) 4 (c) 7 (d) 8

6 The sum of measures of the exterior angles of the triangle equals .....

(a) 90° (b) 180° (c) 360° (d) 720°

7 In the quadrilateral ABCD , if $m(\angle A) = 2\,m(\angle B) = m(\angle C) = 96°$, then $m(\angle D) =$ .....

(a) 96° (b) 48° (c) 120° (d) 144°

8 ABCD is a parallelogram in which : m (∠ A) = 50° , then m (∠ C) = ...

(a) 50° (b) 60° (c) 130° (d) 150°

9 ABCD is a parallelogram in which : m (∠ A) + m (∠ C) = 140°
, then m (∠ B) = ...

(a) 70° (b) 40° (c) 110° (d) 220°

10 If the lengths of two consecutive sides of a parallelogram are 3 cm. and 5 cm. , then its perimeter equals ..... cm.

(a) 12 (b) 14 (c) 16 (d) 18

11 If the perimeter of a parallelogram is 25 cm. and if one of its sides is of length 7 cm. , then the consecutive side is of length ..... cm.

(a) 7 (b) 18 (c) 12.5 (d) 5.5

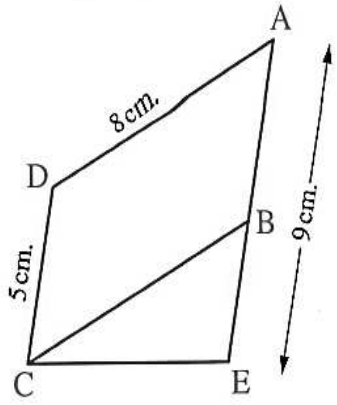
12 **In the opposite figure :**

If ABCD is a parallelogram

, $E \in \overrightarrow{AB}$, CD = 5 cm., AE = 9 cm.

, AD = 8 cm., the perimeter of Δ BEC = 18 cm.

, then the length of $\overline{EC}$ = ... cm.



(a) 8 (b) 6 (c) 5 (d) 4

13 The two diagonals of a rectangle .....

(a) are perpendicular.
(b) are equal in length.
(c) are perpendicular and equal in length.
(d) bisect its interior angles.

14 The two diagonals of a rhombus are .....

(a) perpendicular and not equal in length.
(b) equal in length and not perpendicular.
(c) perpendicular and equal in length.
(d) not equal in length and not perpendicular.

15 The two diagonals of the square are .....

(a) just perpendicular.
(b) just equal in length.
(c) perpendicular and equal in length.
(d) not equal in length and not perpendicular.

16 The adjacent sides are equal in length in a parallelogram, then the figure is a .....

(a) square. (b) rhombus. (c) rectangle. (d) trapezium.

17 If ABCD is a rectangle in which AC = 5 cm., then BD = ... cm.

(a) 2.5 (b) 5 (c) 10 (d) 20

18 If ABCD is a square, then m (∠ CAB) = ...

(a) 90° (b) 45° (c) 60° (d) 30°

19 If ABCD is a parallelogram in which m (∠ A) = m (∠ B), then ABCD is a .....

(a) rectangle. (b) rhombus. (c) square. (d) trapezium.

20 If ABCD is a rhombus in which m (∠ ACB) = 32°, then m (∠ D) = ...

(a) 32° (b) 64° (c) 116° (d) 26°

21 The two vertically opposite angles are .....

(a) complementary. (b) supplementary.

(c) adjacent. (d) equal in measure.

22 The sum of measures of the accumulative angles at a point equals .....

(a) 45° (b) 90° (c) 180° (d) 360°

23 The sum of measures of the interior angles of any quadrilateral equals .....

(a) 180° (b) 170° (c) 90° (d) 360°

24 The number of diagonals of the quadrilateral equals .....

(a) 2 (b) 3 (c) 4 (d) 5

25 If ABCD is a square , then m (∠ CAD) = ...

(a) 90° (b) 60° (c) 45° (d) 30°

26 The two diagonals in the rectangle are .....

(a) parallel. (b) perpendicular.

(c) equal in length. (d) equal in length and perpendicular.

27 The rhombus whose two diagonals are equal in length is called .....

(a) square. (b) rectangle. (c) parallelogram. (d) trapezium.

28 The rhombus whose perimeter is 60 cm. , its side length equals ..... cm.

(a) 20 (b) 18 (c) 15 (d) 10

29 The measure of the interior angle of a regular pentagon equals .....

(a) 135° (b) 540° (c) 108° (d) 110°

30 The measure of the interior angle of a regular hexagon equals .....

(a) 60° (b) 108° (c) 120° (d) 135°

31 The number of diagonals of pentagon equals .....

(a) 3 (b) 5 (c) 7 (d) 9

32 The measure of the exterior angle of a regular polygon is 45° , then the number of its sides is .....

(a) 3 sides. (b) 6 sides. (c) 8 sides. (d) 9 sides.

33 The measure of the interior angle of a regular polygon of 10 sides equals .....

(a) 72° (b) 108° (c) 144° (d) 150°

34 The perimeter of a square of side length 5 cm. is ..... cm.

(a) 10 (b) 20 (c) 15 (d) 25

35 The sum of measures of two consecutive angles in the parallelogram is .....

(a) 90° (b) 180° (c) 120° (d) 360°

36 The parallelogram whose angle is right is called .....

(a) square. (b) rhombus. (c) rectangle. (d) trapezium.

37 If two adjacent sides are equal in a parallelogram , then the figure is .....

(a) square. (b) rhombus. (c) rectangle. (d) trapezium.

38 ABCD is a parallelogram in which m (∠ A) + m (∠ C) = 140° , then m (∠ B) = ...

(a) 40° (b) 140° (c) 110° (d) 70°

39 The two diagonals are equal in length and perpendicular in .....

(a) rhombus. (b) rectangle. (c) square. (d) parallelogram.

40 The two diagonals are equal in length and not perpendicular in .....

(a) square. (b) rectangle. (c) rhombus. (d) parallelogram.

41 The diagonal of the square divides the vertex angle into two angles , the measure of each of them is .....

(a) 45° (b) 30° (c) 90° (d) 60°

42 The diagonal of the square make an angle of measure ..... with any of its sides.

(a) 45° (b) 60° (c) 90° (d) 120°

43 ABCD is a parallelogram in which m (∠ A) = 50° , then m (∠ B) = ...

(a) 50° (b) 130° (c) 180° (d) 90°

44 The sum of measures of the interior angles of a triangle equals .....

(a) 180° (b) 360° (c) 90° (d) 270°

45 The sum of measures of the interior angles of a triangle equals the measure of ..... angle.

(a) right. (b) straight. (c) acute. (d) reflex.

2. Answer the following:

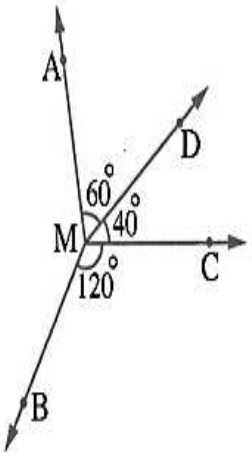
1 **In the opposite figure :**

$m(\angle BMC) = 120°$

, $m(\angle CMD) = 40°$

, $m(\angle DMA) = 60°$

Find : $m(\angle AMB)$



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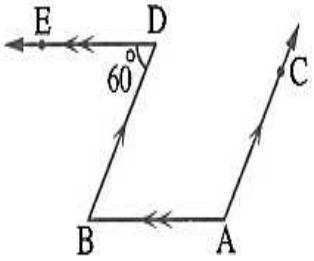
2 **In the opposite figure :**

If $\overrightarrow{DE} // \overline{AB}$

, $\overrightarrow{AC} // \overline{BD}$

, $m(\angle EDB) = 60°$

Find : $m(\angle B)$, $m(\angle A)$



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3 **In the opposite figure :**

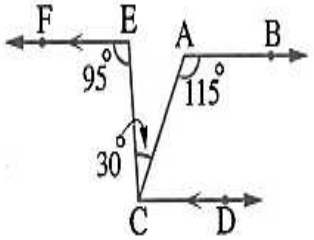
$\overrightarrow{EF} // \overrightarrow{CD}$

, $m(\angle CEF) = 95°$

, $m(\angle ACE) = 30°$

, $m(\angle BAC) = 115°$

Prove that : $\overrightarrow{AB} // \overrightarrow{EF}$



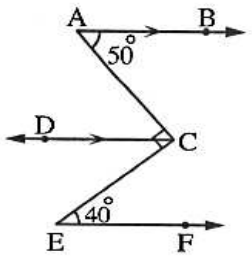
4 **In the opposite figure :**

$\overrightarrow{AB} // \overrightarrow{CD}$

, m (∠ A) = 50° , m (∠ ACE) = 90°

, m (∠ E) = 40°

Prove that : $\overrightarrow{CD} // \overrightarrow{EF}$



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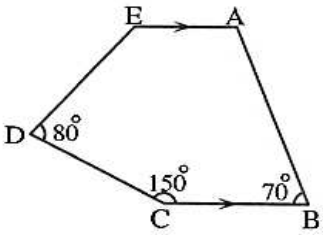
5 **In the opposite figure :**

$\overline{AE} // \overline{BC}$, m (∠ B) = 70°

, m (∠ C) = 150°

, m (∠ D) = 80°

Find by proof : m (∠ E)



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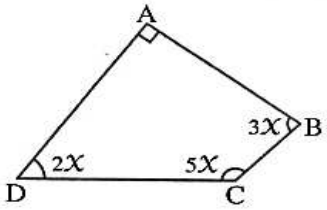
6 **In the opposite figure :**

ABCD is a quadrilateral in which

, m (∠ A) = 90°

Find : The value of x



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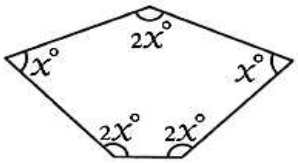
7 **In the opposite figure :**

Find with giving reason

The value of x



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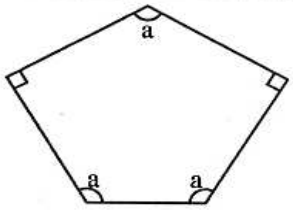
8 **In the opposite figure :**

Find : The value of a



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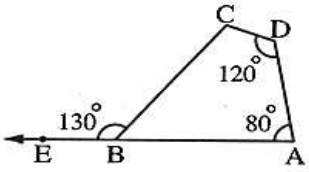
9 **In the opposite figure :**

$E \in \overrightarrow{AB}$, m (∠ A) = 80°

, m (∠ D) = 120° , m (∠ CBE) = 130°

Find : m (∠ C)



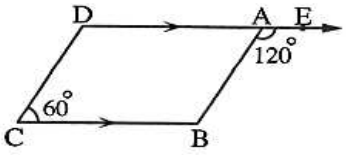
---

10 **In the opposite figure :**

$E \in \overrightarrow{DA}$, m (∠ EAB) = 120°

, m (∠ C) = 60° , $\overrightarrow{DA} // \overline{CB}$

Prove that : ABCD is a parallelogram



11 **In the opposite figure :**

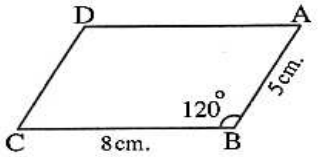
ABCD is a parallelogram

in which : AB = 5 cm.

, BC = 8 cm. , m (∠ B) = 120°

Find : [1] The perimeter of the parallelogram ABCD

[2] m (∠ C)



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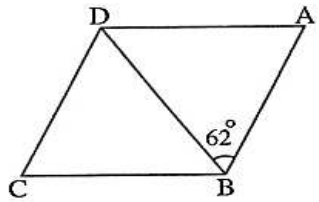
12 **In the opposite figure :**

ABCD is a rhombus in which :

, m (∠ ABD) = 62°

Find with proof : m (∠ A)



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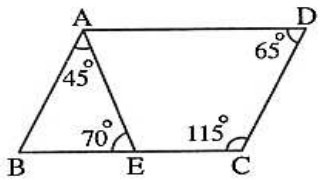
13 **In the opposite figure :**

m (∠ BAE) = 45° , m (∠ AEB) = 70°

, m (∠ D) = 65° , m (∠ C) = 115°

Prove that : ABCD is a parallelogram.



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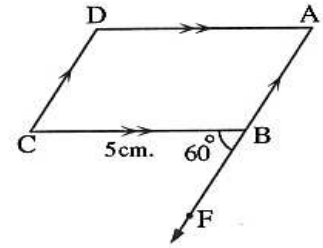
14 **In the opposite figure :**

ABCD is a parallelogram

, m (∠ CBF) = 60°

, BC = 5 cm. , $F \in \overrightarrow{AB}$

Find by proof : m (∠ D) , the length of $\overline{AD}$



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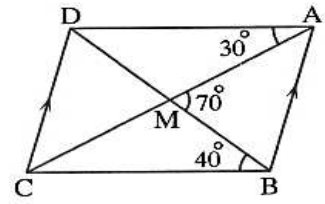
15 **In the opposite figure :**

$\overline{AB} \parallel \overline{DC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, m (∠ DAC) = 30° , m (∠ DBC) = 40°

, m (∠ AMB) = 70°

Prove that : ABCD is a parallelogram.



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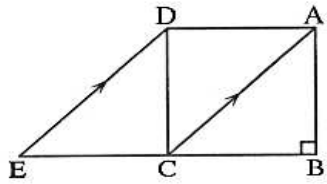
16 **In the opposite figure :**

ABCD ia a square , $E \in \overrightarrow{BC}$

where : $\overline{AC} \parallel \overline{DE}$

Prove that : ACED is a parallelogram.



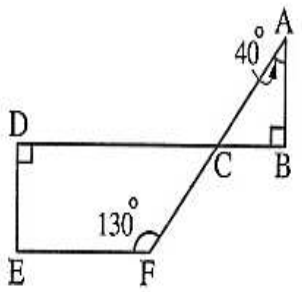
17 **In the opposite figure :**

$\overline{AB}$, $\overline{DE}$ are perpendicular

on $\overline{BD}$, $\overline{BD} \cap \overline{AF} = \{C\}$

, $m(\angle A) = 40°$, $m(\angle F) = 130°$

Find by proof : $m(\angle E)$



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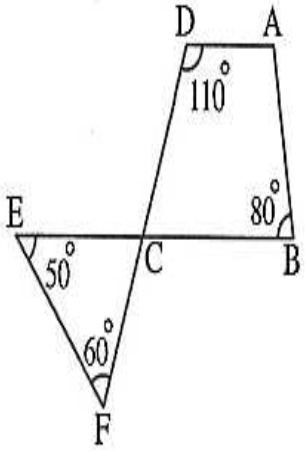
18 **In the opposite figure :**

$m(\angle E) = 50°$, $m(\angle F) = 60°$

, $m(\angle B) = 80°$, $m(\angle D) = 110°$

Find : $m(\angle A)$

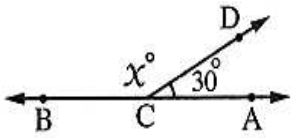


Model 1

Total Mark 5

1 Choose the correct answer from the given ones : (3 Marks)

1 **In the opposite figure :**



If $\overleftrightarrow{AB} \cap \overrightarrow{CD} = \{C\}$, $m(\angle ACD) = 30°$

, then x = ...

(a) 30° (b) 150° (c) 60° (d) 90°

2 The rhombus in which its two diagonals are equal in length is called .....

(a) a parallelogram. (b) a square.

(c) a rectangle. (d) a trapezium.

3 If two straight lines intersect , then each two vertically opposite angles are .....

(a) equal in measure. (b) complementary.

(c) supplementary. (d) adjacent.

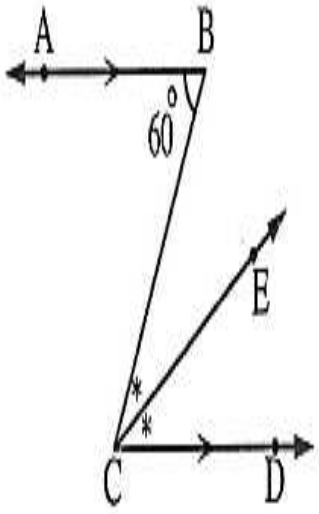
---

2 In the opposite figure : (2 Marks)

$\overrightarrow{BA} // \overrightarrow{CD}$, $m(\angle ABC) = 60°$

, $\overrightarrow{CE}$ bisects $\angle BCD$

Find : $m(\angle ECD)$



Model 2

Total Mark 5

1 **Choose the correct answer from the given ones :** (3 Marks)

1 The number of diagonals of the pentagon is .....

(a) 5 (b) 9 (c) 15 (d) 2

2 If ABCD is a parallelogram , $m(\angle B) + m(\angle C) =$ .....

(a) 70° (b) 180° (c) 90° (d) 360°

3 The parallelogram in which the two diagonals are equal in length is .....

(a) a trapezium. (b) a rhombus. (c) a rectangle. (d) a square.

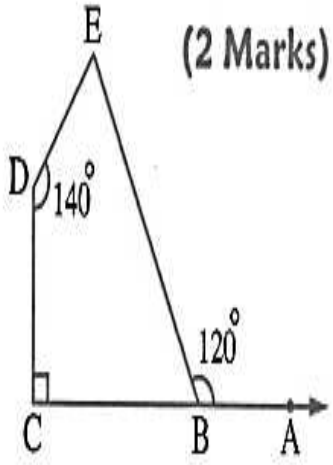
---

2 **In the opposite figure :** (2 Marks)

$A \in \overrightarrow{CB}$, $m(\angle D) = 140°$

, $m(\angle ABE) = 120°$, $\overline{DC} \perp \overline{CB}$

Find : $m(\angle E)$



Model 3

Total Mark 5

1 **Choose the correct answer from the given ones :** (3 Marks)

1 The sum of measures of the accumulative angles at a point equals .....

(a) 45° (b) 90° (c) 180° (d) 360°

2 The measure of the interior angle of a regular hexagon equals .....

(a) 60° (b) 108° (c) 120° (d) 135°

3 The parallelogram whose angle is right is called .....

(a) square. (b) rhombus. (c) rectangle. (d) trapezium.

---

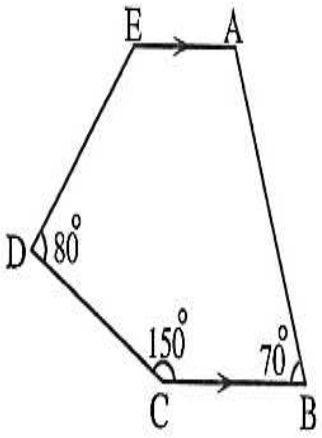
2 **In the opposite figure :**

$\overline{AE} // \overline{BC}$, $m(\angle B) = 70°$

, $m(\angle C) = 150°$

, $m(\angle D) = 80°$

Find by proof : $m(\angle E)$



Model 4

Total Mark 5

1 Choose the correct answer from the given ones : (3 Marks)

1 The sum of measures of the interior angles of any quadrilateral equals .....

(a) 180° (b) 170° (c) 90° (d) 360°

2 The rhombus whose two diagonals are equal in length is called .....

(a) square. (b) rectangle. (c) parallelogram. (d) trapezium.

3 The measure of the exterior angle of a regular polygon is 45° , then the number of its sides is .....

(a) 3 sides. (b) 6 sides. (c) 8 sides. (d) 9 sides.

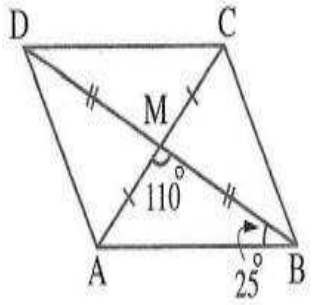
---

2 In the opposite figure : (2 Marks)

ABCD is a quadrilateral its two diagonals intersect at M

, m (∠ AMB) = 110° , m (∠ MBA) = 25°

, MA = MC , MB = MD



1 **Prove that :** ABCD is a parallelogram

2 **Find :** m (∠ ACD)

The Answers:(2.Essay questions)

1 $\because m(\angle AMB) + (\angle CMD) + m(\angle DMA) + m(\angle CMB) = 360°$

$\therefore m(\angle AMB) + 40° + 60° + 120° = 360°$

$\therefore m(\angle AMB) = 360° - 220° = 140°$ (The req.)

---

2 $\because \overrightarrow{DE} // \overrightarrow{AB}$, $\overleftrightarrow{BD}$ is a transversal to them

$\therefore m(\angle B) = m(\angle EDB) = 60°$ (Alternate angles) (First req.)

, $\because \overrightarrow{BD} // \overrightarrow{AC}$, $\overleftrightarrow{AB}$ is a transversal to them.

$\therefore m(\angle A) + m(\angle B) = 180°$ (two interior angles in the same side of the transversal)

$\therefore m(\angle A) = 180° - 60° = 120°$ (Second req.)

---

3 $\because \overrightarrow{EF} // \overrightarrow{CD}$, $\overleftrightarrow{EC}$ is a transversal to them.

$\therefore m(\angle ECD) = m(\angle CEF) = 95°$ (Alternate angles)

$\therefore m(\angle ACD) = 95° - 30° = 65°$

$\therefore m(\angle ACD) + m(\angle A) = 65° + 115° = 180°$

and they are interior angles in the same side of the transversal

$\therefore \overrightarrow{AB} // \overrightarrow{CD}$, $\because \overrightarrow{CD} // \overrightarrow{EF}$

$\therefore \overrightarrow{AB} // \overrightarrow{EF}$ (The req.)

---

4 $\because \overrightarrow{AB} // \overrightarrow{CD}$, $\overleftrightarrow{AC}$ is a transversal to them

$\therefore m(\angle ACD) = m(\angle A) = 50°$ (Alternate angles)

, $\because m(\angle ACE) = 90°$

$\therefore m(\angle DCE) = 90° - 50° = 40°$

$\therefore m(\angle DCE) = m(\angle E)$ and they are alternate angles.

$\therefore \overrightarrow{CD} // \overrightarrow{EF}$ (The req.)

---

5 $\because \overrightarrow{AE} // \overrightarrow{BC}$, $\overleftrightarrow{AB}$ is a transversal to them.

$\therefore m(\angle A) + m(\angle B) = 180°$ (Two interior angles in the same side of the transversal)

$\therefore m(\angle A) = 180° - 70° = 110°$

, $\because$ the sum of the measures of the interior angles of the pentagon ABCDE = 540°

$\therefore m(\angle E) = 540° - (70° + 150° + 80° + 110°) = 130°$ (The req.)

---

6 $\because$ The sum of the measures of the interior angles of the quadrilateral ABCD = 360°

$\therefore 3x + 5x + 2x + 90° = 360°$

$\therefore 10x + 90° = 360°$

$\therefore 10x = 360° - 90° = 270°$

$\therefore x = \frac{270°}{10°} = 27°$ (The req.)

---

7 $\because$ The sum of the measures of the interior angles of the pentagon = 540°

$\therefore x + 2x + 2x + x + 2x = 540°$

$\therefore 8x = 540°$

$\therefore x = \frac{540°}{8} = 67.5°$ (The req.)

---

8 $\because$ The sum of the measures of the interior angles of the pentagon = 540°

$\therefore a + a + a + 90° + 90° = 540°$

$\therefore 3a + 180° = 540°$

$\therefore 3a = 540° - 180° = 360°$

$\therefore a = \frac{360°}{3} = 120°$ (The req.)

---

9 $\because E \in \overrightarrow{AB}$

$\therefore m(\angle ABC) = 180° - 130° = 50°$

, $\because$ the sum of the measures of the interior angles of the quadrilateral ABCD = 360°

$\therefore m(\angle C) = 360° - (50° + 80° + 120°) = 110°$ (The req.)

---

10 $\because \overrightarrow{DE} // \overrightarrow{BC}$, $\overleftrightarrow{AB}$ is a transversal to them

$\therefore m(\angle B) = m(\angle BAE) = 120°$ (Alternate angles)

, $\because m(\angle B) + m(\angle C) = 120° + 60° = 180°$

and they are interior angles in the same side of the transversal

$\therefore \overrightarrow{AB} // \overrightarrow{CD}$, $\because \overrightarrow{AD} // \overrightarrow{BC}$

$\therefore$ ABCD is a parallelogram. (Q.E.D.)

---

11 The perimeter of the parallelogram ABCD

$= (AB + BC) \times 2$

$= (5 + 8) \times 2 = 13 \times 2 = 26$ cm. (First req.)

$\because$ ABCD is a parallelogram

$\therefore m(\angle B) + m(\angle C) = 180°$

$\therefore m(\angle C) = 180° - 120° = 60°$ (Second req.)

12 $\because$ ABCD is a rhombus , $\overline{BD}$ is a diagonal

$\therefore$ m ($\angle$ ABC) = 2 m ($\angle$ ABD) = 2 × 62° = 124°

$\therefore$ m ($\angle$ A) = 180° − 124° = 56° (The req.)

---

13 In Δ ABE : m ($\angle$ B) = 180° − (45° + 70°) = 65°

, $\because$ m ($\angle$ D) + m ($\angle$ C) = 65° + 115° = 180°

and they are interior angles in the same side of the transversal

$\therefore$ $\overline{AD} \parallel \overline{BC}$ (1)

, $\because$ m ($\angle$ B) + m ($\angle$ C) = 65° + 115° = 180°

and they are interior angles in the same side of the transversal

$\therefore$ $\overline{AB} \parallel \overline{CD}$ (2)

, from (1) and (2) :

$\therefore$ ABCD is a parallelogram. (Q.E.D.)

---

14 $\because$ F $\in \overrightarrow{AB}$

$\therefore$ m ($\angle$ ABC) = 180° − 60° = 120°

, $\because$ ABCD is a parallelogram

$\therefore$ m ($\angle$ D) = m ($\angle$ ABC) = 120° (First req.)

, AD = BC = 5 cm. (Second req.)

---

15 $\because$ M $\in \overline{AC}$

$\therefore$ m ($\angle$ BMC) = 180° − 70° = 110°

$\therefore$ in Δ MBC :

m ($\angle$ BCM) = 180° − (110° + 40°) = 30°

$\therefore$ m ($\angle$ BCM) = m ($\angle$ CAD)

and they are alternate angles

$\therefore$ $\overline{AD} \parallel \overline{BC}$

, $\because$ $\overline{AB} \parallel \overline{DC}$

$\therefore$ ABCD is a parallelogram. (Q.E.D.)

---

16 $\because$ $\overline{AD} \parallel \overline{BC}$ (Two opposite sides in the square)

, E $\in \overrightarrow{BC}$ $\therefore$ $\overline{AD} \parallel \overline{CE}$

, $\because$ $\overline{AC} \parallel \overline{DE}$ (Given)

$\therefore$ ACED is a parallelogram. (Q.E.D.)

1. Choose the correct answer:

1 The multiplicative inverse of the number $\left(\frac{2}{5}\right)^0$ is .....

(a) $\frac{5}{2}$ (b) $-\frac{2}{5}$ (c) 1 (d) 0

2 The additive inverse of the number $(-3)^0$ is .....

(a) 1 (b) -3 (c) 3 (d) $-(3)^0$

3 The multiplicative inverse of the number $(-1)^3$ is .....

(a) $(-1)^3$ (b) $(-1)^2$ (c) 1^3 (d) 1^2

4 The additive inverse of the number $\left(-\frac{2}{5}\right)^2$ is .....

(a) $\frac{4}{25}$ (b) $-\frac{4}{25}$ (c) $\frac{25}{4}$ (d) $-\frac{25}{4}$

5 $\left(\frac{1}{4}\right)^0 + \frac{1}{4} =$ .....

(a) $\frac{1}{4}$ (b) $\frac{3}{4}$ (c) $\frac{5}{4}$ (d) $\frac{2}{4}$

6 $\left(\frac{5}{3}\right)^2 \times \left(\frac{3}{5}\right)^0 =$ .....

(a) $\frac{5}{3}$ (b) $\frac{25}{9}$ (c) 0 (d) 1

7 If $x = y$, then $\left(\frac{3}{5}\right)^{x-y} =$ .....

(a) $\frac{3}{5}$ (b) $\frac{5}{3}$ (c) 1 (d) 0

8 $\left(\frac{a}{b}\right)^2 \times \frac{b^2}{a^2} =$ ..... (where $ab \neq 0$)

(a) ab (b) $\left(\frac{a}{b}\right)^4$ (c) $(ab)^0$ (d) $\frac{a}{b}$

9 If $x = -\frac{1}{2}$ and $y = 3$, then $x^y =$ .....

(a) $\frac{1}{8}$ (b) $-\frac{1}{8}$ (c) $\frac{1}{6}$ (d) $-\frac{1}{6}$

10 If $y^{26} + y^{27} = 0$, then $y =$ .....

(a) 1 (b) -1 (c) 2 (d) -2

11 $3^2 \times 3^5 =$ .....

(a) 3^7 (b) 3^3 (c) 3^{10} (d) 3^{25}

12 $5^2 + 5^2 =$ .....

(a) 10^2 (b) 10^4 (c) 5^4 (d) 50

13 $3^5 \times 2^5 =$ .....

(a) 5^{10} (b) 6^{10} (c) 6^5 (d) 6^{25}

14 $(5a)^0 =$ ..... , $a \neq 0$

(a) 5 (b) a (c) 5 a (d) 1

15 $3^{(2^3)} =$ .....

(a) 3^6 (b) 3^5 (c) 3^8 (d) 3^{23}

16 $(5^2)^3 =$ .....

(a) 5^6 (b) 5^5 (c) 5^{23} (d) 5

17 $3^{10} + 3^{10} + 3^{10} =$ .....

(a) 3^{10} (b) 3^{30} (c) 9^{10} (d) 3^{11}

18 $4^x + 4^x + 4^x + 4^x =$ .....

(a) 4^{x+4} (b) 4^{4x} (c) 4^{x+1} (d) $4x^4$

19 $\frac{(3^2)^5}{(3^5)^2} =$ .....

(a) 3^{10} (b) 3^{52} (c) 3^{25} (d) 1

20 $\frac{(x^2)^3}{x^3} =$ ..... , $x \neq 0$

(a) x^6 (b) x^2 (c) x^3 (d) x

21 $(2y)^3 =$ .....

(a) $2y^3$ (b) $8y$ (c) $8y^3$ (d) $23y$

22 $(b^3)^4 =$ .....

(a) b^{34} (b) b^7 (c) $b^3 \times b^3 \times b^3$ (d) $b^4 \times b^4 \times b^4$

23 If $a^{-1} = \frac{2}{3}$, then a = ...

(a) $-\frac{2}{3}$ (b) $\frac{3}{2}$ (c) $-\frac{3}{2}$ (d) 1

24 If $a = 7^{x}$ and $b = 7^{-x}$, then $a \times b$ = ...

(a) 7^{2x} (b) 49^{2x} (c) 1 (d) 0

25 $\frac{5^{x}}{5^{-y}}$ = ...

(a) $5^{x \div y}$ (b) 5^{x-y} (c) 5^{x+y} (d) $-\frac{x}{y}$

26 📖 $\frac{6\,a^2\,x^4}{2\,a^3\,x^3}$ = ...

(a) $3\,a\,x$ (b) $3\,a^5\,x^7$ (c) $\frac{3x}{a}$ (d) $\frac{3}{a\,x}$

27 📖 $\frac{(-2\,s^2\,t)^3}{(-4\,s\,t^2)^2}$ = ...

(a) $-\frac{s^3}{2t}$ (b) $-\frac{s^4}{2t}$ (c) $\frac{s^5}{2\,t^2}$ (d) $\frac{s^4}{t}$

28 📖 $\left(\frac{m^2}{n^{-3}}\right)^{-1}\left(\frac{3\,m^{-2}}{n^{-2}}\right)^{-2}$ = ...

(a) $\frac{9\,m^2}{n^7}$ (b) $\frac{m^2}{9\,n^7}$ (c) $\frac{m^2}{9\,n}$ (d) $\frac{9\,m^6}{n}$

29 📖 $\frac{(2\,a\,b^{-2})^0}{3^0\,a^{-2}\,b}$ = ...

(a) $\frac{a^3}{3\,b^3}$ (b) a^2 (c) 1 (d) $\frac{a^2}{b}$

30 If $a^{x} = 2$ and $a^{-y} = 3$, then a^{x-y} = ...

(a) 1 (b) -1 (c) $\frac{2}{3}$ (d) 6

31 If $x\,y^{-1} = \frac{1}{2}$, then $\frac{y}{x}$ = ...

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) 1 (d) 2

32 $3^{-1} + 3^{-1} + 3^{-1}$ = ...

(a) 3^{-3} (b) 3^3 (c) 9^{-3} (d) 1

33 The multiplicative inverse of 5^{-1} is .....

(a) $\frac{1}{5}$ (b) 5 (c) -5 (d) $-\frac{1}{5}$

34 $(\frac{3}{5})^2 \times (\frac{5}{3})^{-2}$ = ...

(a) $(\frac{3}{5})^4$ (b) 1 (c) $(\frac{3}{5})^{-4}$ (d) 0

35 3.04×10^7 = ...

(a) 340 000 (b) 304 000 (c) 3 400 000 (d) 30 400 000

36 📖 2.37×10^{-4} = ...

(a) 0.00237 (b) 0.000237 (c) 23700 (d) 0.0000237

37 If 0.00079 = 7.9 a , then a = ...

(a) 10^3 (b) 10^{-3} (c) 10^{-4} (d) 10^4

38 If $0.0000503 = m \times 10^{-5}$, then m = ...

(a) 503 (b) 5.03 (c) 50.3 (d) 0.503

39 📖 If the thickness of a sheet of paper is 0.012 cm. , then a ream of 400 sheets is of height .....

(a) 48×10^{-3} cm. (b) 48×10^{-2} cm. (c) 4.8×10^{0} cm. (d) 48 cm.

40 Which of the following equals $\frac{1}{2}$ milliard ?

(a) 50×10^8 (b) 5×10^8 (c) 0.5×10^8 (d) 500×10^7

41 📖 Which of the following is the greatest ?

(a) 6.3×10^5 (b) 9.8×10^4 (c) 5.2×10^5 (d) 7.3×10^4

42 Which of the following is the smallest ?

(a) 0.6×10^5 (b) 0.25×10^5 (c) 7×10^4 (d) 17.5×10^4

43 $6\,000 \times 50$ = ...

(a) 300×10^2 (b) 30×10^5 (c) 3×10^5 (d) 30×10^4

44 45×900 = ...

(a) 4.05×10^2 (b) 4.05×10^3 (c) 4.05×10^4 (d) 45×10^2

45 0.7×0.005 = ...

(a) 3.5×10^3 (b) 3.5×10^{-2} (c) 3.5×10^2 (d) 3.5×10^{-3}

46 📖 The quarter of the number 4^{20} = ...

(a) 4^5 (b) 4^{10} (c) 4^{19} (d) 2^{10}

2. Answer the following:

1. Find the value of the following in the simplest form : $\frac{2^4 \times 2^5}{2^6}$

2. Find the value of the following in the simplest form : $\frac{a^5 \times a^8}{a^3 \times a^2 \times a^4}$ (where $a \neq$ zero)

3. Calculate : $\left(\frac{9^3 \times 9}{9^5}\right)^{-3}$

4. Calculate : $\left(\frac{3^4 \times 7^2}{7^3 \times 3^2}\right)^{-1}$

5. Calculate : $\frac{(10)^2 \times (0.01)^3}{(10)^{-3}}$

6. Find the value of the following in the simplest form : $\left(-\frac{3}{5}\right)^3 \times \left(\frac{-25}{27}\right)$

7. Put the expression : $\left(\frac{1}{2}\right)^2 \times \left(\frac{-1}{2}\right)^3$ in its simplest form.

8. If $x = \frac{1}{2}$, $y = \frac{1}{3}$, find the numerical value of : $(x + y)^{-2}$

9. If $x = -\frac{1}{2}$, $y = -\frac{3}{4}$, find the value of : $\left(\frac{y}{x^2}\right)^{-2}$

10. Simplify to the simplest form : $(x^2)^{-3} \div (x^{-1})^2$ where $x \neq 0$

11. Find the value of the following in the simplest form : $\left(\frac{-2}{3}\right)^3 \times \left(\frac{1}{3}\right)^3 \div \left(\frac{-2}{9}\right)^2$

12. If $x = \frac{-3}{2}$, $y = \frac{1}{2}$, $z = \frac{4}{3}$ find in the simplest form the value of : $x^2 y^2 z^2$

13. Calculate the value of : $\left(\frac{-2}{5}\right)^x + \left(\frac{2}{5}\right)^y$ If $x = 4$, $y = 3$

14. If $a = -\frac{1}{2}$, $b = 2$ and $c = \frac{3}{4}$, find the numerical value of : $a^3 b^2 + b^2 c - 8 abc$

15. Write the following number in the standard form : 581 200 000 000

16. Find the result in the standard form : $(2.3 \times 10^3) + (6.3 \times 10^4)$

17. Write the result of : $(4.4 \times 10^3) \times (2 \times 10)^5$ in the standard form.

18. Calculate the value of the following in the standard form : $(3.6 \times 10^8) \div (1.8 \times 10^3)$

Model 1

Total Mark 5

1 Choose the correct answer from the given ones : **(3 Marks)**

1 The additive inverse of the number $\left(-\frac{2}{3}\right)^4$ is .....

(a) $\frac{2}{3}$ (b) $-\frac{16}{81}$ (c) $\frac{81}{16}$ (d) $-\frac{81}{16}$

2 If $0.0028 = 2.8 \times a$, then a = ...

(a) 3 (b) -3 (c) 10^3 (d) 10^{-3}

3 If $2^{10} + 2^{10} = 2^k$, then k = ...

(a) 4 (b) 20 (c) 100 (d) 11

---

2 Simplify : $\frac{b^3 \times b^{-5}}{b^{-2} \times b^6}$ **(2 Marks)**

, then find the value of the result when b = 2

Model 2

Total Mark 5

1 Choose the correct answer from the given ones : **(3 Marks)**

1 If $2^{-5} \times 3^{-5} = 6^k$, then k = ...

(a) 6 (b) -10 (c) 25 (d) -5

2 3.04×10^7 = ...

(a) 340 000 (b) 304 000 (c) 3 400 000 (d) 30 400 000

3 $4\,x^{-1}\,y^{-2} = \frac{4}{.....}$ (where $x \neq 0$, $y \neq 0$)

(a) $y^2\,x^{-1}$ (b) $x\,y^{-2}$ (c) $x\,y^2$ (d) $y\,x^2$

---

2 Simplify to the simplest form : $\frac{4^{n+1} \times 3^{n-1}}{12^n}$ **(2 Marks)**

Model 3

Total Mark 5

1 **Choose the correct answer from the given ones :** **(3 Marks)**

1 $\left(-\frac{2}{3}\right)^{-3}$ = ...

(a) $\frac{-8}{27}$ (b) $\frac{-27}{8}$ (c) $\frac{8}{27}$ (d) $\frac{27}{8}$

2 Half the number 2^{20} = ...

(a) 2^{18} (b) 2^{19} (c) 2^{4} (d) 2^{5}

3 The number which is in standard form from the following is .....

(a) 11×10^{8} (b) 9.7×10^{-5} (c) 10.2×10^{-2} (d) 0.87×10^{8}

2 If $x = \frac{-3}{2}$, $y = \frac{1}{2}$, $z = \frac{4}{3}$ find in the simplest form the value of : $x^2 y^2 z^2$

(2 Marks)

Model 4

Total Mark 5

1 **Choose the correct answer from the given ones :** **(3 Marks)**

1 $a^{-4} \div a^{-6}$ = ... (Where $a \neq$ zero)

(a) a^{-10} (b) a^{-2} (c) a^{2} (d) a^{10}

2 The multiplicative inverse of the number $(-3)^{zero}$ is .....

(a) 3 (b) 3 (c) – 1 (d) 1

3 If $3500 = 3.5 \times 10^{n}$, then n = ...

(a) 3 (b) – 3 (c) 1 (d) 2

2 If $x = \frac{1}{2}$, $y = \frac{1}{3}$, find the numerical value of : $(x + y)^{-2}$

(2 Marks)

The Answers: (1.Choose)

1 (c)	2 (d)	3 (a)	4 (b)	5 (c)
6 (b)	7 (c)	8 (c)	9 (b)	10 (b)
11 (a)	12 (d)	13 (c)	14 (d)	
15 (c)	16 (a)	17 (d)	18 (c)	
19 (d)	20 (c)	21 (c)	22 (d)	
23 (b)	24 (c)	25 (c)	26 (c)	
27 (b)	28 (b)	29 (d)	30 (d)	
31 (d)	32 (d)	33 (b)	34 (a)	
35 (d)	36 (b)	37 (c)	38 (b)	
39 (c)	40 (b)	41 (a)	42 (b)	
43 (c)	44 (c)	45 (d)	46 (c)	